RACE, SEX AND BUSINESS ENTERPRISE: EVIDENCE FROM THE STATE OF MINNESOTA

Prepared for the Minnesota Department of Transportation

by

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I. INTRODUCTION

The Minnesota State Department of Transportation (Mn/DOT) commissioned NERA Economic Consulting to perform this study in compliance with United States Department of Transportation (USDOT) regulations.

Mn/DOT was created to provide a balanced transportation system for the state. Minnesota's transportation system includes aeronautics, highways, motor carriers, ports, public transit, railroads and pipelines. Mn/DOT spends more than $500 million annually on federally-assisted capital projects to maintain and improve a statewide system of roadways that will provide safe, reliable, affordable and efficient services for the State of Minnesota.

Each federal fiscal year, the Federal Highway Administration (FHWA) and the other modal agencies of USDOT provide significant levels of federal funding to Mn/DOT to support its construction and preservation activities. Between Federal Fiscal Year (FFY) 2000 and FFY 2004, for example, Mn/DOT received more than $1.9 billion from the FHWA. As a recipient of such funds, Mn/DOT is required to comply with the regulations pertaining to the USDOT's Disadvantaged Business Enterprise (DBE) Program.[1] The primary concern of the DBE Program is to create a level playing field for the utilization of businesses owned by socially and economically disadvantaged persons, including members of certain minority groups and women, on contracts that are funded in part or in whole by USDOT.

In 1999, USDOT adopted a comprehensive revision of the DBE Program.[2] Mn/DOT must set an overall, annual aspirational percentage goal for DBE participation on its USDOT-assisted contracts that are narrowly tailored to Mn/DOT's particular circumstances and based on demonstrable evidence of availability—*i.e.*, the percentage of relevant businesses owned by minorities or women in Mn/DOT's geographic market area.[3]

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[1] 49 Code of Federal Regulations (CFR), part 26

[2] *Id.*

[3] 49 CFR § 26.45.

The process for determining availability is twofold.[4] First, Mn/DOT must make a determination of the baseline percentage of firms in its relevant market area that are or could become certified as DBEs. Second, Mn/DOT must consider other relevant information and make a determination about whether, and if so by how much, the baseline figure should be adjusted upward or downward in order to set an overall goal that is consistent with what would be expected in a market that is race- and sex- neutral, *i.e.*, DBE availability "but for" discrimination.[5] This two-step method requires Mn/DOT to set a DBE goal that prevents under-utilization of DBEs and over-utilization of DBEs to the exclusion of non-DBEs. Under the regulations, if an agency exceeds its overall goal for two consecutive years through the use of contract-specific DBE participation goals, it must proportionately reduce its use of contract-specific goals in the following year.[6]

For this study, NERA used minority-owned and women-owned business (MWBE) availability as a proxy for DBE availability. The MWBE and DBE populations have a very high degree of correlation and overlap. There are two differences worth noting, however.

First, to be certified as a DBE under Part 26 a business owner's personal net worth, excluding equity in the owner's primary residence and in the business seeking certification, cannot exceed $750,000.[7] Hence, not all MWBEs are eligible for certification as DBEs. In practice, however, very few households—especially minority households—have net worth levels in excess of $750,000, especially when home equity and business equity are excluded from the measure.[8] Second, it is possible for businesses owned by non-minority males, such

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[4] *Id.*

[5] *Ibid*.

[6] 49 C.F.R. § 26.51(f).

[7] 49 CFR § 26.67.

[8] According to the Federal Reserve's *1993 National Survey of Small Business Finances*, about 6 percent of White-male-owned small businesses, 2.6 percent of White-female-owned small businesses, and 3 percent of non-White-owned small businesses have business equity in excess of $750,000. Further, Census Bureau data show that the median net worth of Black and Hispanic households is much less than the median for White households. Very few Black or Hispanic households have net worth above even $500,000. Only 0.2 percent of Black households and 0.5 percent of Hispanic households have a net worth greater than $500,000—compared to a figure of 4 percent for White households. Overall, the median net worth for White households is approximately seven times higher than that of Black or Hispanic households. (See U.S. Census Bureau, "Percent Distribution of Household Net Worth, by Amount of Net Worth and Selected Characteristics: 1995," INTERNET:
(continued...)

as businesses owned by disabled persons, to become certified as DBEs if they can establish that they meet the regulatory criteria to be considered socially and economically disadvantaged.[9] Hence, not all DBEs are necessarily MWBEs. In practice, however, since so few MWBEs have net worth levels in excess of $750,000 and a substantial number of businesses owned by socially and economically disadvantaged non-minority males could potentially seek DBE certification NERA's method may understate DBE availability to a small degree.[10]

NERA's approach to availability measurement reflects USDOT's compliance advice. According to the USDOT's guidance, "… if you have data about the number of minority and women-owned businesses (regardless of whether they are certified as DBEs) in your market area, or DBEs in your market area that are in other recipients' Directories but not yours, you can supplement your Directory data with this information. *Doing so may provide a more complete picture of the availability of firms to work on your contracts than the data in your Directory alone*."[11]

The remainder of this report is organized as follows. Section II describes the assembly of the contract and subcontracting database and how the definition of the relevant markets. Section III describes the methods employed to estimate baseline DBE availability and Section IV presents a summary of these methods and the principal results of the availability analysis (step 1). Section V describes the compelling interest evidence

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http://www.census.gov/hhes/www/wealth/1995/wlth95-4.html and U.S. Census Bureau, "Median Value of Assets for Households, by Type of Asset Owned and Selected Characteristics: 1995," INTERNET: http://www.census.gov/hhes/www/wealth/1995/wlth95-1.html). More recent Federal Reserve Board data also document that the net worth of White households is much greater than that of Black or Hispanic households. The Federal Reserve's *1998 Survey of Consumer Finances* found that the median net worth of non-minority households was $94,900 and the mean net worth was $334,400. For minority households, the median net worth was $16,400 and the mean net worth was $101,700 (See Kennickell, Arthur B., Starr-McCluer, Martha, and Surette, Brian J., "Recent Changes in U.S. Family Finances: Results from the 1998 Survey of Consumer Finances," Federal Reserve Bulletin, January 2000).

[9] 49 CFR § 26.67 and Appendix E.

[10] For ease of exposition, we shall use the term DBE throughout the remainder of the report.

[11] *See* INTERNET: http://osdbu.dot.gov/business/dbe/hottips.cfm (emphasis added). This information was released as official guidance by USDOT. See 49 CFR §26.9.

considered concerning a possible Step 2 adjustment of the baseline availability figures. At Mn/DOT's request, we report estimates of DBE availability for contract, subcontract, and supplier opportunities in construction and in architectural/engineering design and other professional construction-related consulting.

II. DEFINING THE RELEVANT MARKETS

The first step in estimating DBE availability is to define the relevant markets for Mn/DOT's federally-assisted contracting. Markets have a product and a geographic dimension, both of which were considered in constructing our estimates of DBE availability.[12] Once the appropriate markets have been defined, we can estimate the number of businesses present in those markets as well as the number that are owned by minorities or women. Finally, Mn/DOT construction contract and subcontract award and consultant expenditure data are used to develop dollar-based weights for each relevant industry and county. These weights are combined and then used to calculate overall weighted average DBE availability for the State of Minnesota and each of its eight highway districts.

A. Preparing the master contract/subcontract database

In order to identify the product and geographic markets relevant to Mn/DOT, we assembled a master database of Mn/DOT construction and construction-related activity awarded between Federal Fiscal Year (FFY) 2000 and FFY 2004. This section describes the types of federally-assisted Mn/DOT projects that are included in the study scope: (1) FHWA-assisted Construction projects and (2) FHWA-assisted Architectural/Engineering Design and Other Construction-Related Consulting Services projects. We use FFY 1999-FFY 2004 data from both categories to identify the industries in Mn/DOT's product market and the counties in its geographic market.

1. Construction

NERA worked with Mn/DOT staff to obtain records on all federally-assisted construction contracts and associated subcontracts for projects awarded from October 1999 through September 2004. A total of 780 prime contracts were awarded during that period with an aggregate value of approximately $2.76 billion. For each contract, our profile included the unique contract identification number, unique business identification number,

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[12] *See*, for example, Areeda, Phillip, and Louis Kaplow, *Antitrust Analysis: Problems, Text, Cases*, Boston: Little, Brown and Company, 4th Edition, 1988.

business name, business address, award date, contract award amount and federal assistance participation percentage.

Wisely, Mn/DOT has collected and retained key information on the first-tier subcontractors and suppliers for all construction projects. These records include each firm's unique business identification number, business name, business address, contract award amount, and DBE status. We obtained these records from Mn/DOT as well.

Next, we cross-referenced each firm identified with Mn/DOT vendor records, Dun & Bradstreet, and ABI-Inform in order to obtain a primary Standard Industrial Classification (SIC) code for each firm.[13]

2. Architectural/Engineering Design and Other Construction-Related Consulting Services

We also worked with Mn/DOT staff to identify all federally-assisted contracts for architectural/engineering design and related professional consulting services (hereafter, "Consulting") awarded between October 1999 and September 2004. We obtained data for 3,740 such contracts from that period with an aggregate value of approximately $226.4 million. For contracts, we received data including the unique contract identifier, unique business identifier, business name, amount paid, and DBE status.

As with the construction projects, we next assigned primary SIC codes to each consultant in file, again using Mn/DOT's own vendor data, Dun & Bradstreet, and ABI-Inform.

B. Product Market Definition

Based on the SIC codes assigned to each firm in the master contract/subcontract database, we estimated product market weights according to the proportion of total dollars attributable to each SIC code. These weights show the relative importance, in dollars, of the activity represented in each SIC code.

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[13] We assigned or confirmed each firm's type of work using four-digit SIC codes, which are the most detailed level available in the SIC system.

In Construction, we identified 102 distinct SIC codes within the 780 contracts we studied. Of these 98 SIC codes, however, 35 account for more than 95 percent of the total dollars spent. For this study, we take these 35 SIC codes to represent Mn/DOT's Construction product market.

In Consulting, we identified 30 distinct SIC codes within the 3,740 contracts we studied. Of these 30 SIC codes, however, 9 account for more than 95 percent of the total dollars spent. For this study, we take these 9 SIC codes to represent Mn/DOT's Consulting product market.

Although numerous industries play a role in Mn/DOT's contracting activities, it is clear that contracting opportunities are not distributed evenly among them. The distribution of contract expenditures is, in fact, highly skewed. Overall (Table 1), four industries account for almost four-fifths of spending during the study period. In Construction (Table 2), a single industry—highway and street construction—accounts for 70 percent of all contracting expenditures, and the top nine industries account for 90 percent. Concentration is also prevalent in Consulting (Table 3), where a single industry— Engineering Services— accounts for 55 percent of all expenditures and five industries collectively account for almost 90 percent.

C. Geographic Market Definition

We turn next to a determination of the geographic dimension of Mn/DOT's contracting markets. We used the master contract/subcontract database, as described above in Section II.A, to obtain the zip codes for each contractor and subcontractor in the database. We then disaggregated the database by state, highway district, and county and calculated the percentage of Mn/DOT contract dollars awarded to businesses in different geographic areas. Table 4 presents the results of these calculations.

Businesses located in Minnesota account for the vast majority of Mn/DOT's contracting expenditures, regardless of category. As shown in Table 4, Mn/DOT awarded 89.4 percent of its construction dollars during the study period to contractors with businesses located in Minnesota.[14] For consulting contracts, the figure was 90.7 percent,[15] and the combined figure is 89.5%. Based on these results, we will define Mn/DOT's geographic market to be the State of Minnesota for purposes of estimated availability.

Within the State of Minnesota, there is still considerable county-to-county variation in Mn/DOT's contract spending. Table 5 shows, for example, that businesses located in Hennepin, Dakota, Chisago, and Wright Counties account for relatively more construction contract and subcontract dollars than do businesses located elsewhere in the State, and that consulting work, is centered strongly around Hennepin and Ramsey Counties.[16]

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[14] After Minnesota, the most important states in terms of contract dollars were Wisconsin (3.8 percent), Georgia (3.0 percent), and North Dakota (2.0 percent).

[15] After Minnesota, the most important states in terms of contract dollars were Illinois (3.2 percent), Massachusetts (1.4 percent), and Kentucky (1.1 percent).

[16] No contractors or subcontractors were located in the Minnesota counties of Grant, Kittson, Lake, Renville, Watonwan, Wilkin, or Yellow Medicine.

III. IDENTIFYING BUSINESSES IN THE RELEVANT MARKETS

The DBE availability percentage (unweighted) is defined as the number of DBEs divided by the total number of businesses in the counties and industries relevant to Mn/DOT's contracting activities.[17] Determining the total number of businesses in the relevant markets is more straightforward than determining the number of minority- or women-owned businesses in those markets. The latter task has three main parts: (1) identify all listed DBEs in the relevant market; (2) verify the ownership status of listed DBEs; and (3) estimate the number of unlisted DBEs in the relevant market. This section describes, in turn, how both tasks were accomplished.

A. Estimate the Total Number of Businesses in the Market

We used Dun & Bradstreet's *MarketPlace* database to determine the total number of businesses operating in the relevant geographic and product markets (these markets were discussed in the previous section). *MarketPlace* is a comprehensive database of U. S. businesses. This database, which contains over 13 million records, is updated continuously, and Dun & Bradstreet issues a revised version each quarter. For this study, we used data for the second quarter of 2005. Each record in *MarketPlace* represents a business and includes the company name, address, telephone number, primary four-digit SIC code, secondary SIC code(s) (if any), business type, DUNS Number (a unique number assigned to each business by Dun & Bradstreet) and other descriptive information. Dun & Bradstreet gathers and verifies information from many different sources. These sources include annual management interviews, payment experiences, bank account information, filings for suits, liens, judgments and bankruptcies, news items, the U. S. Postal Service, utility and telephone service, business registrations, corporate charters, Uniform Commercial Code filings, and records of the Small Business Administration and other governmental agencies.

We used the *MarketPlace* database to identify the total number of businesses in each four-digit SIC code to which we had assigned a product market weight.[18] Table 6

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[17] To yield a percentage, the resulting figure is multiplied by 100.

[18] These weights are described above in Section II.B.

shows the number of businesses identified in each SIC code, along with the associated industry weight (all contracting combined). Comparable data for construction and consulting appear in Tables 7 and 8, respectively. The industry weights that are listed are the same as those appearing above in Tables 1-3, respectively.

B. Identify Listed DBEs

As extensive as it is, *MarketPlace* itself does not adequately identify all businesses owned by minorities or women. Although many such businesses *are* correctly identified in *MarketPlace*, experience has demonstrated that many more are missed. For this reason, several additional steps were required to identify the appropriate percentage of DBEs in the relevant market.

First, NERA completed an intensive regional search for information on minority-owned and woman-owned businesses in Minnesota. Beyond the information already in *MarketPlace*, NERA collected lists of DBEs from Mn/DOT as well as other public and private entities in the State of Minnesota. Specifically, directories were included from: Business Research Services National Directory of Minority-Owned Businesses, Business Research Services National Directory of Women-Owned Businesses, Diversity Information Resources, the federal government's Central Contractor Registration database, the Minnesota Department of Transportation directory of certified DBEs, the Hennepin County CERT program for Small Business Enterprises, the Minnesota Materials Management Division, the Minnesota American Indian Chamber of Commerce, National Association of Minority Contractors of Upper Midwest, the Native American Business Development Center, the United Indian Development Association, the Minnesota Indian Owned Business directory, and the Small Business Administration federal data base of Small, Minority, and Woman Business Enterprises.

In addition, we attempted to acquire minority and woman business directories from the following entities: Minnesota Black Chamber of Commerce, National Association of Women in Construction – Southeast Minnesota Chapter, University of St. Thomas Small Business Development Center, The Minnesota Minority Supplier Development Council, Metropolitan Economic Development Association, National Association of Women Business Owners Minnesota, Hispanic Chamber of Commerce Minnesota, Minnesota

Korean Chamber of Commerce, Women Business Enterprise National Council, Association of Women Contractors, Asian-American Chamber of Commerce, Minnesota Hmong Chamber of Commerce, Asian Business Association of University Avenue, U.S. Pan Asian American Chamber of Commerce, Vietnamese-Minnesota Chamber of Commerce, Sri Lanka Chamber of Commerce, the Chinese American Business Association of Minnesota, and the University of Minnesota Office for Business and Community Economic Development. The preceding agencies were unable to provide a directory, either due to proprietary issues or lack of response to repeated queries.

In our research, we also identified and contacted several other promising entities; however we learned that they do not maintain such directories. These entities included the University of Minnesota Office for Business and Community Economic Development, the Latin Business Association, Minnesota Small and Underutilized Business Program, Workforce Solutions Ramsey County Inclusiveness in Contracting Program, Hennepin County Purchasing and Contract Services Targeted Contract Service Program, Association of General Contractors, Minnesota Asphalt Pavement Association, Minnesota Nursery and Landscape, The Minnesota Twins, The Minnesota Timberwolves, Minnesota Subcontractors, Minneapolis Consortium of Community Developers, Associated Builders and Contractors, Inc., Asian Women in Business, Works in Progress, Inc., American Indian Neighborhood Development Corporation, African American Friendship Association for Cooperation and Development, and various Minnesota county governments, with the exception of those included under the CERT program.

We will refer to the DBE businesses identified in this manner as "listed" DBEs. Tables 9-11 provide the total number of listed DBEs by SIC code—overall, and for construction and consulting, respectively.[19]

If the listed DBEs identified in the three previous tables are *all* in fact DBEs and are the *only* DBEs among all the businesses identified in Tables 6-8, then an estimate of "listed" DBE availability would be calculated as shown in Tables 12-14. The availability figure in these tables is simply the number of listed DBEs (taken from Tables 9-11,

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[19] The industry weights appearing in Tables 9-11 are identical to those in Tables 6-8, respectively.

respectively) divided by the total number of businesses in the relevant market (taken from Tables 6-8, respectively).[20] However, as we shall see below neither of these two conditions is true.

For two reasons, the percentages in the three previous tables are not suitable as availability measures. First, it is likely that some proportion of the DBEs listed in the tables are not actually minority-owned or woman-owned. Second, it is likely that there are additional "unlisted" DBEs among all the businesses included in Tables 6-8. Such businesses do not appear in any of the directories we gathered and are therefore not included as DBEs in Tables 9-11. Additional steps are required to test these two conditions and to arrive at a narrowly tailored representation of DBE availability in the State of Minnesota. We discuss these steps in Sections III.C and III.D below.

C. Verify Listed DBEs and Estimate Unlisted DBEs

It is likely that information on DBEs from *MarketPlace* and other DBE directories is not all correct. Phenomena such as ownership changes, associate or mentor status, recording errors, or even outright misrepresentation could lead to businesses being listed as DBEs in a particular directory even though they are actually owned by White males. Other things equal, this type of error would cause our availability estimate to be biased upward from the "true" availability number.

The second likelihood that must be addressed is that not all DBE businesses are necessarily listed—either in *MarketPlace* or in any of the other directories we collected. Such phenomena as geographic relocation, ownership changes, directory compilation errors, and limitations in DBE outreach could all lead to DBEs being unlisted. Other things equal, this type of error would cause our availability estimate to be biased downward from the "true" availability number.

In our experience, we have found that both types of bias are not uncommon. The bias can be corrected however using statistical sampling procedures. For this study, we

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[20] The industry weights appearing in Tables 6-8 are identical to those in Tables 9-11. The "average availability" figure appearing at the bottom of each table is unweighted. That is, neither product market weights nor geographic weights have been applied. These weights are applied below.

developed a set of corrections based on the results of more than 6,000 telephone surveys we conducted to measured how often business ownership was misclassified (or unclassified) by race and/or sex.[21]

Strata were defined listed DBE status. During the telephone surveys, up to ten attempts were made to reach each business in a given random sample and speak with an appropriate respondent. Attempts were scheduled for a mix of day and evening, weekdays and weekends, and appointments were scheduled for callbacks when necessary. Approximately two-thirds of the sample was comprised of firms that were unclassified by race or sex (putative White Males) and the remaining one-third was made up of firms that were classified putatively as Minorities or White Females.[22]

The first part of the telephone survey tested whether our samples of listed DBEs were correctly classified by race and/or sex. The second part tested whether the unclassified firms could all be properly classified as non-DBEs. The results of the surveys are summarized below in Tables 15 and 16, respectively.

Table 15 shows that the amount of misclassification is substantial in all SIC codes and highway districts. Misclassification was highest among apparent Hispanic firms, followed by Native American firms. Misclassification was lowest among apparent Black firms, followed by Asians, and White Females.

We base our correction factors on the amount of misclassification we observed among the putative DBE firms that we interviewed. For example, our results show that of 1,147 putatively White Female firms interviewed, 72.2 percent of these firms are actually White female-owned, 23.8 percent are actually White male-owned, and 4.0 percent are actually minority-owned. Therefore, we assign each putative White female record a 72.2

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[21] A very similar methodology has been employed by the Federal Reserve Board to deal with similar problems in designing and implementing the National Surveys of Small Business Finances for 1993 and 1998. *See* Catherine Haggerty, Karen Grigorian, Rachel Harter and John D. Wolken, "The 1998 Survey of Small Business Finances: Sampling and Level of Effort Associated with Gaining Cooperation from Minority-Owned Business," *Proceedings of the Second International Conference on Establishment Surveys,* Buffalo, N.Y., June 17-21, 2000.

[22] By "putative," we mean the race and sex that we initially assigned to each firm based on the information provided by Dun & Bradstreet or by our master M/W/DBE directory.

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percent probability of actually being White female-owned, a 23.8 percent probability of actually being White male-owned, and a 4.0 percent probability of being minority-owned. Next we turn to putatively White Male firms.

In a manner exactly analogous to our surveys of listed DBEs, in the second part of our surveys we examined unclassified businesses, *i.e.*, any business that was not originally identified as a DBE, either in *MarketPlace* or in one or many other directories collected during our research.

Table 16 shows that of the 4,399 establishments interviewed, 88.9 percent were owned by White males, 8.3 percent by White females, and 2.8 percent by minorities. Misclassification was substantial across SIC codes and highway districts.

As with the surveys of listed DBEs, we assigned probability values (probability actually White male-owned, probability actually White female-owned, probability actually Black-owned, etc.) based on the interview responses. Putative White Male firms were assigned a probability of 88.9 percent that they were actually White Male owned, 8.3 percent that they were actually White Female owned, and 2.8 percent that they were actually minority-owned. Clearly, the large majority of unclassified businesses (almost 89 percent overall) are White male-owned. Nevertheless, more than 11 percent were *not* White male-owned. Of the latter, the largest group was owned by White females, with descending size shares accounted for by Asians, Native Americans, Hispanics, and Blacks, respectively.

IV. ESTIMATING BASELINE DBE AVAILABILITY

All the steps necessary to calculate overall weighted average DBE availability are now complete. We briefly summarize each step below. Table 17 details the results from each step for all Mn/DOT federally-assisted contracting activity. Tables 18-19 repeat the process for construction and consulting contracts.

Identify the relevant geographic market. Determine the states and counties where prime contractors and subcontractors are located based on Mn/DOT's contract expenditure data. Identify the geographic areas that account for the majority of Mn/DOT's contract and subcontract activity.

Identify the relevant product market and associated industry weights. Determine which SIC codes best represent contracting and subcontracting opportunities on Mn/DOT projects with federal participation, based on expenditure data for Mn/DOT's construction and architectural/engineering design contracts and subcontracts. Next, calculate the dollar value attributable to each SIC code as a percentage distribution. The resulting percentage figures are used to calculate industry-weighted DBE availability. In contrast to an unweighted figure, the industry-weighted DBE availability figure gives greater weight to DBE availability from those industries where Mn/DOT spends more contract dollars, and lesser weight to availability in those industries where fewer dollars are spent.

Count all businesses in the relevant geographic and product market. Determine the total number of businesses in each relevant SIC code, state, and county from Dun & Bradstreet's *MarketPlace*. This determination was made overall as well as separately for construction and consulting.

Identify "listed" DBE businesses in relevant markets. Some DBEs were directly identified in Dun & Bradstreet's *MarketPlace* or in Mn/DOT's DBE directory. Other businesses in *MarketPlace* were identified as DBEs by cross-referencing name and address information from numerous regional directories of minority- and women-owned firms collected for this study. This determination was made overall as well as separately for construction and consulting.

Verify ownership status of listed DBEs. To correct for race and sex misclassification, conduct interviews with listed DBEs to verify ownership status. Calculate the percentage of listed DBEs that are actually owned by White males. Separate calculations were made by SIC code grouping and by race and sex.

Verify ownership status of unclassified firms. To correct for race and sex misclassification, conduct interviews with businesses that were not listed as DBEs in order to determine their ownership status. Calculate the percentage of unclassified businesses that are actually DBEs and non-DBEs. Separate calculations were made by SIC code grouping and by race and sex.

Table 17 shows a total of 26,979 businesses operating in the 40 SIC codes within Mn/DOT's geographic market (*see* Table 1). Of these, 6.85 percent were listed DBEs. With industry weights, the percentage shrinks to 6.35 percent. This decrease occurs primarily because the proportion of listed DBEs in certain industries is less than the overall average. Our misclassification survey found that approximately 25 percent of listed DBEs were not actually DBEs. Our survey also found that approximately 11 percent of unclassified firms were actually DBEs. Combining these two groups of DBEs yields availability of 15.60 percent, which then falls slightly to the final overall baseline availability figure of 15.30 percent once industry weights are applied. Tables 18-19 provide similar derivations for construction and consulting, respectively.

The final results of our baseline DBE availability analysis for Mn/DOT are shown in Table 20. Overall, DBE availability for Mn/DOT contracts is estimated to be 15.30 percent. Availability for construction contracts is estimated to be 15.18 percent. Availability for consulting contracts is estimated to be 16.58 percent. Availability results are also presented by highway districts and by the race and sex of business ownership.

V. DBE PARTICIPATION IN MN/DOT CONTRACTING AND SUBCONTRACTING, FFY 2000-2004

Using the databases of Mn/DOT contracting and subcontracting activity described above in Section II.A.1 and II.A.2, we calculated the fraction of all contracts, subcontracts, contract dollars and subcontract dollars received by DBEs. Tables 21-27 below provide this information from several important perspectives: (1) federally-assisted versus non-federally-assisted contracts, (2) prime contract gross amount versus prime contract amount net of subcontracted amounts, and (3) prime contract dollars versus prime contract and first-tier subcontract dollars combined. Tables 21-26 cover Mn/DOT construction projects and Table 27 covers Mn/DOT consulting projects. Results are presented for White males, White females, Blacks, Asians, Native Americans, all MBEs combined, and all DBEs combined.

An examination of the results in Tables 21-27 shows that: (1) the DBE share of contracts is greater than the DBE share of contract dollars, (2) DBE participation in subcontracting is greater than DBE participation in prime contracting, and (3) in Construction, overall DBE participation is higher on federally-assisted projects than on non-federally-assisted projects. DBE participation as prime contractors, however, is higher on non-federally funded projects than on federally-assisted ones.

Next we can also compare DBE participation during the portion of the study period when Mn/DOT's DBE program was enjoined post-*Sherbrooke I* (October through December 1999) to participation since the injunction was lifted (January 2000-September 2004). There were 7 federally-assisted prime contracts and 22 associated subcontracts in Mn/DOT's construction records that were awarded during the injunction period. DBE participation on those contracts was less than eight one-hundredths of one percent, or $13,000 out of $16M. There were also 5 non-federally-assisted contracts and 10 associated subcontracts during this same time period; DBE participation on those contracts was $0 out of $7.8M.

By comparison, DBE participation on federally-assisted contracts awarded after Mn/DOT adopted a new DBE Program in conformance with Part 26 and based upon the 2000 NERA Study, was approximately 5.2 percent on contracts with goals and 2.5 percent on contracts without goals. A total of 4 out of 547 prime contracts were

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awarded to DBEs (0.7%) and 889 out of 5311 subcontracts (16.7%). On projects without goals, 2 out of 226 prime contracts went to DBEs (0.9%) and 103 out of 973 subcontracts (10.6%).

Extending the post-injunction comparison of contracts with goals and contracts without goals to non-federally-assisted projects, we find that $2.6M out of $13.0M went to DBEs (20.1%). One out of 9 prime contracts (11.1%) and 12 out of 42 subcontracts were awarded to DBEs (27.9%). On non-federally assisted contracts without goals, $11.2M out of $494.2M was awarded to DBEs (2.3%). A total of 22 out of 636 such prime contracts were awarded to DBEs (3.5%) and 42 out of 915 subcontracts (4.6%).

Overall, for federally-assisted projects both with and without goals DBES were awarded $142.2M out of a total of $2.745B (5.2%). Six out of 773 prime contracts were awarded to DBEs (0.8%) and 992 out of 6284 subcontracts (15.8%). For non-federally-assisted projects both with and without goals, DBEs were awarded $13.8M out of $507.2M (2.7%). Twenty-three out of 645 prime contracts were awarded to DBEs (3.6%) and 54 out of 958 subcontracts (5.6%).

The amount of DBE subcontracting participation that could be expected in the absence of race- or sex-conscious subcontracting goals can be estimated based on the amount of DBE subcontracting participation on projects without DBE goals. For all construction contracts examined during the study period (both federally-assisted and non-federally-assisted), DBE participation on projects without goals was 2.3 percent. For White Females, the figure is 1.8 percent, and for Blacks, Hispanics, Asians, and Native Americans, the figures are, respectively, 0.0 percent, 0.2 percent 0.2 percent, and 0.1 percent. For federally-assisted projects, the 6 corresponding figures are 2.4 percent, 1.3 percent, 0.0 percent, 0.4 percent, 0.5 percent, and 0.2 percent.

Finally, several implications are apparent from these findings:

1) DBE participation dropped to virtually zero on federally-assisted contracts during the injunction period and to absolute zero on non-federally-assisted contracts.

2) Since DBE participation on non-goals contracts, both federally-assisted and non-federally-assisted, is higher during the operation of the Program than DBE participation when the Program was enjoined, it appears that mere fact of adopting a

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DBE program - whether or not goals are being set on any given contract — increases DBE participation. This means that when we measure race- and gender-neutral participation levels by observing DBE participation on projects without goals, we may be over-estimating the race- and gender-neutral portion somewhat and underestimating the portion attributable to race- and gender-conscious measures.

3) DBE participation in Minnesota is higher when goals are implemented than when they are not, regardless of whether there is federal-assistance or not.

4) Overall, DBE participation is higher on federally-assisted than on non-federally-assisted contracts, even with the existence of the State Targeted Business Goals program.

VI. DISPARITIES IN MBE BUSINESS FORMATION AND BUSINESS OWNER EARNINGS

In this section, we examine qualitative and quantitative evidence relevant to establishing whether expected DBE availability in Mn/DOT's construction and consulting contracting markets would, absent business-related discrimination, be substantially and significantly higher or lower than the levels shown above in Table 20. The baseline availability figures calculated in the previous section represent the percentage of businesses in Mn/DOT's construction and consulting markets that are owned by minorities and/or women. These availability figures will be artificially low if discrimination has led minorities and women to be more reluctant to start businesses or if it has contributed to the businesses they start being less profitable and therefore more likely to fail.

For this reason, 49 CFR §26.45 requires recipients of federal funds to consider whether an adjustment to the baseline DBE availability figures such as those reported in Table 9 would be necessary in order to approximate the amount of DBE availability that would be expected in a race-neutral marketplace, that is, "but for" discrimination. This is referred to in the regulations as the step 2 adjustment.[23] Specifically, recipients must examine the volume of work DBEs have performed for them in the past as well as findings from any relevant disparity studies conducted within the recipient's jurisdiction. Recipients must also consider "evidence from related fields that affect the opportunities for DBEs to form, grow and compete" to the extent available.[24]

In keeping with these requirements, this final section of the Study summarizes evidence relevant to whether an adjustment is warranted and, if so, what size adjustment would be narrowly tailored to that evidence. First, we review the microeconomic and microeconometric literature on self-employment and entrepreneurship.

Secondly, we present statistical evidence of disparities in business formation and business owner earnings, based on entrepreneur microdata from the 2000 Decennial Census and from the 1979-2002 Current Population Surveys. The presence of

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[23] 49 CFR § 26.45(d).

statistically significant business formation and earnings disparities is consistent with present discrimination in the Mn/DOT marketplace and/or the present effects of past discrimination in the Mn/DOT marketplace. This evidence of business formation disparities forms the basis for quantifying the amount of upward or downward adjustment from Step 1 availability that would be consistent with a race-neutral marketplace.

Finally, in order to shed light on how much of Mn/DOT's annual DBE goal is susceptible to fulfillment by race-neutral measures alone, we examine the past volume of construction and consulting work performed for Mn/DOT and its prime contractors by DBEs, comparing utilization differences on federally-assisted versus non-federally funded projects as well as differences on projects with DBE goals versus projects without DBE goals. NERA's estimates of DBE availability from the previous section (*See* Table 20) are substantially higher than average DBE utilization levels achieved by Mn/DOT between FFY 2000 and FFY 2004.[25]

A. Review of Relevant Literature

We examine here disparities in business formation and earnings principally in the private sector, where contracting and procurement activity is generally *not* subject to MWBE requirements. Statistical examination of disparities in the private sector economy surrounding the State of Minnesota is important for at least three reasons. First, to the extent that discriminatory practices by contractors, suppliers, insurers, lenders, customers, and others limit the ability of DBEs to compete, those practices are likely to be felt in the larger private sector as well as in the public sector. Second, examining the utilization of DBEs in the private sector provides an indicator of the extent to which DBEs are used in the absence of affirmative action efforts, since few firms in the private sector make such efforts. This is the type of evidence courts have examined in determining whether race-conscious remedies

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(...continued)

[24] 49 CFR § 26.45(d)(2).

[25] *See* Tables 21-27.

are necessary to overcome discrimination.[26] Third, the Supreme Court in *Croson* acknowledged that state and local governments have a constitutional duty not to contribute to the perpetuation of racial or ethnic discrimination in the private sector of the local economy.[27]

After years of comparative neglect, research on the economics of entrepreneurship—especially upon self-employment—is beginning to expand.[28] In the United States, for example, minorities start businesses at much lower rates than non-Hispanic Whites. These disparities persist even when factors such as geography, industry, occupation, age, education and assets are held constant.[29]

One possible impediment to entrepreneurship among minorities is lack of capital.[30] The key test shows that, all else remaining equal, people with greater family assets are more likely to become self-employed. This asset variable enters probit equations significantly and

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[26] *See Western States Paving Co. v. Washington State Department of* Transportation, 907 F.3d 963 (9th Cir. 2005); *Northern Contracting Inc. v. Illinois Department of Transportation,* 2005 U.S. Dist. LEXIS 19868 (N.D. Ill. Sept 8, 2005); *Concrete Works of Colorado Inc.* v. *City and County of Denver*, 321 F.3d 950 (10th Cir. 2003), *cert. denied*, 124 S.Ct. 556 (2003).

[27] 488 U.S. at 492.

[28] Blanchflower [8]. Microeconometric work includes Fuchs [30], Borjas and Bronars [17], Evans and Jovanovic [22], Evans and Leighton [23], Fairlie [24], Fairlie and Meyer [11, 26], Reardon [48], Wainwright for the United States [54], Rees and Shah [49], Pickles and O'Farrell [46], Blanchflower and Oswald [11, 12, 13], Meager [43], Taylor [53], Robson for the UK[50, 51] , DeWit and van Winden for the Netherlands [21], Alba-Ramirez for Spain [2], Bernhardt [6], Schuetze [52], Arai [3], Lentz and Laband [40], and Kuhn and Schuetze] for Canada [38, Laferrere and McEntee for France [39], Blanchflower and Meyer [10] and Kidd for Australia [36], and Foti and Vivarelli for Italy [29]. There are also several theoretical papers including Kihlstrom and Laffonte [36], Kanbur [35], Coate and Tennyson [19], and Holmes and Schmitz [31], plus a few papers that draw comparisons across countries *i.e.*, Schuetze for Canada and the U.S. [52], Blanchflower and Meyer for Australia and the U.S. [10], Alba-Ramirez for Spain and the United States [2], and Acs and Evans for many countries [1].

[29] Public Use Microdata Samples (PUMS) data from the 1990 Census, Wainwright [54].

[30] In work based on U.S. micro data at the level of the individual, Evans and Leighton [23], and Evans and Jovanovic [22] have argued formally that entrepreneurs face liquidity constraints. The authors use the National Longitudinal Survey of Young Men for 1966-1981, and the Current Population Surveys for 1968-1987.

with a quadratic form. Indeed, the probability of self-employment depends positively upon whether the individual ever received an inheritance or gift.[31]

Further, house prices through the impact of equity withdrawal play a powerful role in affecting the supply of small new firms.[32] Again, this suggests capital constraints. Transfers of firms within families will also help to preserve the status quo, and work in particular against the interests of Blacks who do not have as strong a history of business ownership as indigenous Whites. Likewise, because the offspring of self-employed fathers are more likely than others to become self-employed, the historically low rates of self-employment among Blacks and Latinos may contribute to their low contemporary rates.[33]

Nationally, the self-employment rate of Black males is one third of that of White males and has remained roughly constant since 1910. Because neither trends in demographic factors, including the Great Migration from southern to northern states and the racial convergence in education levels, nor an initial lack of business experience, nor the lack of traditions in business enterprise among Blacks that resulted from slavery explains a substantial part of the current racial gap in self-employment,[34] a considerable portion of the explanation of the differences between the Black and White self-employment rate can be attributed to discrimination.[35] There is strong evidence that racial differences in levels of financial capital have significant effects upon racial patterns in business failure rates.[36] Further, the Black exit rate from self-employment is twice as high as that of Whites.[37]

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[31] Blanchflower and Oswald [12]. This emerges from British data, The National Child Development Study, a birth cohort of children born in March 1958 who have been followed for the whole of their lives. The authors also find that, when directly questioned in interview surveys, potential entrepreneurs say that raising capital is their principal problem. Additionally, Blanchflower and Oswald find that the self-employed report higher levels of job and life satisfaction than employees, and that psychological test scores play only a small role in explaining entry into self-employment. Work by Holtz-Eakin, Joulfaian and Rosen drew similar conclusions using different methods on U.S. data [32, 33].

[32] Black, Meza, and Jeffreys [7]; Cowling and Mitchell [20].

[33] Hout and Rosen [34].

[34] Fairlie and Meyer (2000) ([27] p. 664)

[35] Robert Fairlie [24] and Wainwright [54].

[36] Timothy Bates [5].

[37] Fairlie [24].

B. Race and Sex Disparities in Earnings

In this section we examine earnings to determine whether minority and female entrepreneurs earn less from their businesses than do their White male counterparts. Other things equal, if minority and female business owners as a group cannot achieve comparable earnings from their businesses as similarly-situated non-minorities because of discrimination, then failure rates for MWBEs will be higher and MWBE formation rates will be lower than would be observed in an unremediated (i.e. race- and sex-neutral) and non-discriminatory marketplace. Both phenomena would contribute directly to lower levels of minority and female business ownership.

Below, we first examine earnings disparities among wage and salary employees, that is, non-business owners. It is critical to examine this segment of the labor force since a key source of new entrepreneurs in any given industry is the pool of experienced wage and salary workers in that same industry.[38] Any employment discrimination that adversely impacts the ability of minorities or women to succeed in the labor force directly shrinks the available pool of potential MWBEs. In almost every instance examined, a statistically significant adverse impact on earnings is observed in both the economy at large and in the construction and construction-related professional services sector.[39]

We then turn to an examination of differences in earnings among the self-employed, that is, among business owners. Here too, among the pool of minorities and women who have formed businesses despite discrimination in both employment opportunities and business opportunities, statistically significant adverse impacts are observed in the vast majority of cases both in construction and the economy as a whole.

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[38] Blanchflower [8, 9].

[39] There is a growing body of evidence that discriminatory constraints in the capital market prevent minority-owned businesses from obtaining business loans. Furthermore, even when they are able to obtain them there is evidence that these loans are not obtained on equal terms: minority-owned firms pay higher interest rates, other things being equal. This is another form of discrimination with an obvious and direct impact on the ability of racial minorities to form businesses and to expand or grow previously formed businesses. Additionally, see the detailed discussion of this phenomenon in D. G. Blanchflower, P. B. Levine, and D. Zimmerman, "Discrimination in the market for small business credit market," NBER Working Paper W6840, 1999.

The remainder of this section discusses the methods and data we employed and presents the specific findings we obtained.

1. Methods

We used a statistical technique known as linear regression analysis to estimate the effect of each of a set of observable characteristics, such as education and age, on an outcome variable of interest. In this case, the outcome variable of interest is earnings and we used regression to compare earnings among individuals in similar geographic and product markets at similar points in time and with similar years of education and potential labor market experience and see if any adverse race or sex differences remain. In a discrimination free market place, one would not expect to observe significant differences in earnings by race or sex among such similarly situated observations.

Regression also allows us to narrowly tailor our statistical tests to the State of Minnesota and assess whether disparities in the State of Minnesota are statistically significantly different from those observed elsewhere in the nation. Starting from an economy-wide data set, we first estimate the basic model of earnings differences just described and also include an indicator variable for the State of Minnesota. This model appears as Specification (1) in Tables 28 through 39. Next, we estimate Specification (2), which is the same model as (1) and additionally includes indicator variables that interact race, sex, and location in State of Minnesota. Specification (3) represents our ultimate specification, which includes all the variables from the basic model as well as any of the interaction terms from Specification (2) that are statistically significant.[40]

Any negative and statistically significant differences by race or sex that remain in Specification (3) after holding all of these other factors constant—time, age, education, geography, and industry—are consistent with what would be observed in a market suffering from business-related discrimination.

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[40] If none of these terms is significant then Specification (3) reduces to Specification (1).

2. Data

The analyses undertaken in this report require individual-level data (*i.e.*, "microdata") with relevant information on business ownership status and other key socioeconomic characteristics. Two primary sources of such data are available.

The first is the Five Percent Public Use Microdata Samples (PUMS) from the 2000 decennial census. The 2000 PUMS contains observations representing five percent of all U.S. housing units and the persons in them (approximately 14 million records). Released in late 2003, the PUMS provides the full range of population and housing information collected in the 2000 census. Business ownership status is identified in the PUMS through the "class of worker" variable, which distinguishes the unincorporated and incorporated self-employed from others in the labor force. The presence of the class of worker variable allows us to construct a detailed cross-sectional sample of individual business owners and their associated earnings.

The second source of data is the Current Population Survey (CPS). The CPS has been conducted monthly by the Census Bureau and the Bureau of Labor Statistics for over 40 years, and is a primary source of official government statistics on employment and unemployment. Currently, about 56,500 households are scientifically selected for the CPS on the basis of area of residence in order to represent the nation as a whole, individual states and the largest metropolitan areas. In addition to information on employment status, the CPS collects information on age, sex, race, marital status, educational attainment, earnings, occupation, industry, and other characteristics. These statistics serve to update the information collected every 10 years through the decennial census.[41]

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[41] Since 1979, about a quarter of the households in each monthly CPS survey have been asked to provide additional information, including usual weekly earnings and weekly hours of work. These households are said to be in "Outgoing Rotation Groups" (ORG) because of the way the CPS rotates households for interviews. Each household selected for the survey is interviewed once a month for four consecutive months, not interviewed for eight months, and interviewed again once a month for four more months. The households in the ORG are those that are in either the fourth or the eighth survey. The ORG files of the CPS include individual data for about 30,000 individuals each month, or over 350,000 per year. Data in which the State of Minnesota is identifiable are available in a comparable form from 1986 through 2002. Data from the ORG files are used below in addition to the PUMS to examine earnings disparities among wage and salary workers. The ORG files however, do not contain data on the earnings of the self-employed. Annual earnings, whether from wages or self-employment are available

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3. Findings: Race and Sex Disparities in Wage and Salary Earnings

Tables 28 through 33 report results from our regression analyses of annual earnings among wage and salary workers. Tables 28 through 30 focus on the economy as a whole and Tables 31 through 33 on construction and construction-related professional services. Tables 28 and 31 are derived from the 2000 PUMS, Tables 29 and 32 are derived from the 1979–1991 CPS, and Tables 30 and 33 are derived from the 1992–2002 CPS. The numbers shown in each of these six tables indicate the percentage difference between the average wages of a given race/sex group and comparable White males.

a. Specification (1) - the Basic Model

For example, in Table 28 Specification (1) the estimated percentage difference in annual wages between Blacks (both sexes) and White males in 2000 was -29.7 percent. That is, average annual wages among Blacks were 29.7 percent lower than for White males who were otherwise similar in terms of geographic location, industry, age, and education. The number in parentheses below each percentage difference is the t-statistic, which indicates whether the estimated percentage difference is statistically significant or not. In Tables 28 through 33, a t-statistic of 1.99 or larger indicates statistical significance at a 95 percent confidence level or better.[42] In the example just used, the t-statistic of 182.46 indicates that the result is statistically significant.

Specification (1) in Tables 28-30 shows negative and statistically significant wage disparities for Blacks, Hispanics, Asians, Native Americans, persons reporting in multiple race categories, and White women consistent with the presence of discrimination in these

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from the March CPS, however, also known as the Annual Demographic File. This latter file also contains the basic monthly demographic and labor force data. In the March CPS, data on employment, earnings, and income refer to the preceding year, although demographic data refer to the time of the survey. The March surveys are therefore included for the years 1987-2003. Because the information relates to the preceding year, the earnings data relate to the years 1986-2002. The sample consists of any individual who reports positive self-employment earnings in the year preceding the interview.

[42] From a two-tailed test.

markets. Observed disparities are large as well, ranging from a low of -16.7 percent for Hispanics in Table 29 to a high of -35.8 percent for White women in Table 28.

Specification (1) in Tables 31 through 33 shows similar results when the basic analysis is restricted to the construction and construction-related professional services sector. In this sector, large, negative, and statistically significant wage disparities are observed for all minority groups and for White women. For Blacks, the large wage disparities observed in the construction sector are similar to those observed economy-wide. Large wage disparities in construction are also observed for Hispanics, Asians, and Native Americans; however, the differences are smaller than those observed in the economy as a whole. For White women, large disparities are observed both economy-wide and in construction—however, disparities in construction are larger.

Specification (1) in, respectively, Tables 29 and 30 and Tables 32 and 33 describes changes in observed wage disparities over time. For the economy as a whole, as well as for the construction sector, disparities for Blacks became slightly smaller between 1979–1991 (Tables 29 and 32) and 1992–2002 (Table 30 and 33), but remain large (average wages more than 20 percent below comparable White males). For Hispanics, wage disparities increased substantially during the same period and average wages remain 14-20 percent lower than for comparable White males in construction and elsewhere. For White women, wage disparities grew substantially smaller between the two periods, both in construction and in the economy as a whole, although they remain large (average wages 18-25 percent below comparable White males).[43]

Finally, the coefficient on the indicator variable for the State of Minnesota is negative in the PUMS and CPS data for the economy as a whole. These data indicate that residents of the State of Minnesota, on average, are at a modest wage disadvantage compared to their similarly situated counterparts elsewhere in the nation. The observed wage disadvantages for the State as a whole are even larger for minorities and women however.

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[43] It is not possible to perform a similar comparison for Asians or Native Americans, as they were not identified separately in the CPS prior to 1992 and instead were classified together as "Other Race."

In the construction sector, the PUMS data show a significant wage advantage enjoyed by Minnesotans over their counterparts elsewhere in the U.S. This advantage is not evident, however, in the CPS data. Moreover, it is more than offset by the wage disadvantages observed for minorities and women in Minnesota's construction sector.

b. Specifications (2) and (3) - the Full Model Including Minnesota-Specific Interaction Terms

Next, we turn to Specifications (2) and (3) in Tables 28 through 33. In each of these Tables, Specification (2) is the basic regression model enhanced by the addition of a set of interaction terms that test whether minorities and women in the State of Minnesota differ significantly from those elsewhere in the U.S. economy. For example, specification (2) in Table 28 shows a -29.0 percent wage difference that estimates the direct effect of being Asian in 2000, as well as a statistically significant 14.3 percent wage increment in that year that captures the indirect effect of residing in the State of Minnesota and being Asian. Therefore, the net wage disparity for Asians in the State of Minnesota is approximately -14.7 percent (-29.0 percent plus 14.3 percent).

Specification (3) simply repeats Specification (2), dropping any Minnesota interaction terms that are not statistically significant. In Table 28, for example, the only interaction terms included in the final specification were for Asians, Native Americans, and White women. The net result of Specification (3) in Tables 28, 29 and 30 is evidence of large, negative and statistically significant wage disparities for all minority groups and for White women. The same result holds in the construction sector in Tables 31 and 32, and in Table 33 as well for all but Blacks and Asians, where joint differences are not statistically significantly different from zero.

Overall, prime age minorities and women earn substantially and significantly less from their labors than their White male counterparts. Such disparities are symptoms of discrimination in the labor force that, in addition to its direct effect on workers, reduce the future availability of DBEs by stifling opportunities for minorities and women to progress through precisely those internal labor markets and occupational hierarchies that are most likely to lead to entrepreneurial opportunities in the first place. These disparities reflect more than "societal discrimination" because they demonstrate the relationship between

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discrimination in the job market and reduced entrepreneurial opportunities for minorities and women. Other things equal, these reduced entrepreneurial opportunities in turn lead to lower DBE availability levels than would be observed in an unremediated marketplace.

4. Findings: Race and Sex Disparities in Business Owner Earnings

We turn next to the analysis of race and sex disparities in business owner earnings. Tables 34 through 39 report results from regression analyses of earnings from self-employment. Tables 34 through 36 focus on the economy as a whole and Tables 37 through 39 focus on construction and construction-related professional services. Tables 34 and 37 are derived from the 2000 PUMS, Tables 35 and 38 are derived from the 1979–1991 CPS, and Tables 36 and 39 are derived from the 1992–2002 CPS. The numbers shown in each of these six tables indicate the percentage difference between the average annual self-employment earnings of a given race/sex group and comparable White males.

a. Specification (1) - the Basic Model

Specification (1) in Tables 34 through 36 shows negative and statistically significant and large wage disparities for Blacks, Hispanics, Asians, Native Americans, persons of mixed race, and White women consistent with the presence of discrimination in these markets. The measured difference for Blacks ranges between 28 percent and 59 percent; for Hispanics, from 19 percent to 39 percent; for Asians, from 4 percent to 22 percent; and for Native Americans, from 38 percent to 51 percent. The largest business owner earnings disparities, however, are observed for White women: between 44 percent and almost 73 percent.

Specification (1) in Tables 37 through 39 shows similar results for the construction and construction-related professional services sector. Large negative earnings disparities are observed in every case. Most of instances these differences are statistically significant as well.

Specification (1) in, respectively, Tables 35 and 36 and Tables 38 and 39 describes changes in observed business owner earnings disparities over time. For the economy as a whole (Tables 35 and 36), disparities for Blacks and Hispanics have worsened over time. In the construction sector, disparities for Blacks and Hispanics remained large but were

smaller in 1992-2002 than in 1979-1991. For White women, while disparities have lessened somewhat in the economy as a whole, in the construction sector disparities remain as large during the 1992-2002 period as during the 1979-1991 period.

Finally, with respect to Specification (1), the indicator variable for the State of Minnesota is significantly negative Tables 34 and 35, and insignificantly different from zero in Table 36. This indicates that entrepreneurs in the State of Minnesota, in the economy as a whole, face an apparent earnings disadvantage over similarly situated entrepreneurs elsewhere in the nation. In the construction sector, however, no earnings difference between Minnesotans and their counterparts elsewhere in the nation is observed.

b. Specifications (2) and (3) - the Full Model Including Minnesota-Specific Interaction Terms

Next we turn to Specifications (2) and (3) in Tables 34 through 39. Specification (2) is the basic regression model enhanced by a set of interaction terms to test whether minorities and women in the State of Minnesota differ significantly from persons elsewhere in the U.S. economy. Specification (3) drops any Minnesota interaction terms that are not statistically significant.

For the economy as a whole (Tables 34 through 36), none of the Minnesota interaction terms is statistically significant, indicating that estimates for Minnesota are similar to results from elsewhere in the nation. The final results for these three tables therefore are as given in Specification (1). The same is true in Tables 37 and 39, though not Table 38, where the final results are as in Specification (3).

As was the case for wage and salary earners, prime age minority and female entrepreneurs earn substantially and statistically significantly less from their efforts than similarly situated White male entrepreneurs. These disparities are a symptom of discrimination in commercial markets that directly and adversely affects DBEs. Other things equal, if due to discrimination minorities and women cannot earn remuneration from their entrepreneurial efforts comparable to that of White males, growth rates will slow, business failure rates will increase, and as demonstrated in the next section, business

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formation rates will decrease. Combined, these phenomena result in lower DBE availability levels than would be observed in an unremediated marketplace.

C. Race and Sex Disparities in Business Formation

Finally, we turn to the analysis of race and sex disparities in business formation.[44] In this section, we compare self-employment rates by race and sex to determine whether minorities or women are as likely to enter the ranks of entrepreneurs as similarly-situated White males. We find that they are not as likely to do so and that minority business formation rates would likely be substantially and significantly higher if markets operated in a race- and sex-neutral manner.

Discrimination in the labor market, symptoms of which are evidenced in Section B.3 above, might cause wage and salary workers to turn to self-employment in hopes of encountering less discrimination from customers and suppliers than from employers and co-workers. Other things equal, and assuming minority and female workers did not believe that discrimination pervaded commercial markets as well, this would lead minority and female business formation rates to be higher than would otherwise be expected.

On the other hand, discrimination in the labor market prevents minorities and women from acquiring the very skills, experience, and positions that are often observed among those who leave the ranks of the wage and salary earners to start their own businesses. Many construction contracting concerns have been formed by men who were once employed as foreman for other contractors, fewer by those who were employed instead as laborers. Similarly, discrimination in commercial capital and credit markets, as well as asset and wealth distribution, prevents minorities and women from acquiring the financial credit and capital that are so often prerequisite to starting or expanding a business. Other things equal, these phenomena would lead minority and female business formation rates to be lower than otherwise would be expected.

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[44] We use the phrases "business formation rates" and "self-employment rates" interchangeably in this Study.

Further, discrimination by commercial customers and suppliers against DBEs, symptoms of which are evidenced in Section B.4 above and elsewhere, operates to increase input prices and lower output prices for DBEs. This discrimination leads to higher rates of failure for some minority and women firms, lower rates of profitability and growth for others, and prevents some minorities and women from ever starting businesses.[45] All of these phenomena, other things equal, would contribute directly to lower observed rates of minority and female self-employment.

1. Methods and Data

To see if minorities or White women are as likely to be business owners as are comparable White males, we use a statistical technique known as Probit regression. Probit regression is used to determine the relationship between a categorical variable—one that can be characterized in terms of a yes or no response as opposed to a continuous number— and a set of characteristics that are related to the outcome of the categorical variable. Probit regression produces estimates of the extent to which each characteristic is positively or negatively related to the likelihood that the categorical variable will be a yes or no. For example, Probit regression is used by statisticians to estimate the likelihood that an individual participates in the labor force, retires this year, or contracts a particular disease— these are all variables that can be categorized by a response of yes (for example, she is in the labor force) or no (for example, she is not in the labor force)—and the extent to which certain factors are positively or negatively related to the likelihood (for example, the more education she has, the more likely that she is in the labor force). Probit regression is one of several techniques that can be used to examine qualitative outcomes. Generally, other techniques such as Logit regression yield similar results.[46] In the present case, Probit regression is used to examine the relationship between the choice to own a business (yes or no) the other demographic and socioeconomic characteristics in our basic model. The

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[45] See also the materials cited at fn. 39 *supra*.

[46] For a detailed discussion, see G.S. Maddala, *Limited Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, 1983. Probit analysis is performed here using the "dprobit" command in the statistical program STATA.

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underlying data for this section is once again the 2000 PUMS, the 1979-1991 CPS, and the 1992-2002 CPS.

2. Findings: Race and Sex Disparities in Business Formation

As a point of reference for what follows, Tables 40 and 41 provide a summary of business ownership rates in 2000 by race and sex. A striking feature of both tables is how much higher business ownership rates in the United States are for White males than for any other group. Table 40, for example, shows almost a 10 percentage point difference between the overall self-employment rate of Blacks and White Males in the State of Minnesota (12.9 – 33.2 = 9.7), and Table 41 shows more than a 21 percentage point difference in the construction sector self-employment rate for this group. Results such as this are observed whether we consider the country as a whole or only the State of Minnesota, it is apparent in the construction sector as well as in the economy as a whole, and it is evident for all minority groups and for White women.

There is no doubt that part of the group differences shown in Tables 40 and 41 are associated with differences in the distribution of individual characteristics and preferences between minorities, women, and White males. It is well known that personal earnings tend to increase with age, for example. It is also true that the propensity toward self-employment increases with age.[47] Since most minority populations in the U.S. have a lower median age than the non-Hispanic White population, we must examine whether the disparities in business ownership evidenced in Tables 40 and 41 are largely—or even entirely—due to differences in the age distribution of minorities compared to non-minorities or other factors such as education, geographic location, or industry preferences.

The remainder of this section presents a series of regression analyses designed to address whether large, negative and statistically significant race and sex disparities are found among otherwise similarly-situated individuals. Tables 42 through 47 report results from regression analyses of the decision to start a business. Tables 42 through 44 focus on the economy as a whole and Tables 45 through 47 focus on construction and construction-

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[47] Wainwright [54] p. 86.

related professional services. As in previous sections, the first in each triad of Tables is derived from the 2000 PUMS, the second from the 1979–1991 CPS, and the third from the 1992–2002 CPS. The numbers shown in each of these tables indicate the percentage point difference between the probability of self-employment for a given race/sex group and for comparable White males.

a. Specification (1) - the Basic Model

Specification (1) in Tables 42 through 44 shows negative, statistically significant and large business formation disparities for Blacks, Hispanics, Asians, Native Americans, persons of mixed race, and White women consistent with the presence of discrimination in these markets.

Specification (1) in Tables 45 through 47 shows similar large, negative, and statistically significant business formation disparities for every group in the construction and construction-related professional services sector.

Once again, Specification (1) in, respectively, Tables 43 and 44 and Tables 46 and 47 describes changes in observed business owner earnings disparities over time. For the economy as a whole as well as for the construction sector, disparities for Blacks and Hispanics have actually worsened in recent years, while those for Asians and Native Americans have changed only little. In the construction sector, disparities for White women have lessened substantially in the construction sector, although they remain large. Disparities for White women in the economy as a whole, in contrast, did not change much between the two periods.

b. Specifications (2) and (3) - the Full Model Including Minnesota-Specific Interaction Terms

Several of the Minnesota interaction terms included in Specification (2) were significant. The final results are in Specification (3) for Tables 42-44, and in Specification (1) for Tables 45-47. To summarize for the economy-wide results (Tables 42-44):

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- The remaining business formation difference for Blacks ranges between 6.9 and 8.1 percentage points (approximately 53-63 percent lower than the corresponding White male business formation rate).

- For Hispanics, from 4.1 to 6.0 percentage points (approximately 32-47 percent lower than the White male business formation rate).

- For Asians, from 1.5 to 4.2 percentage points (approximately 12-33 percent lower than the White male business formation rate).

- For Native Americans, from 3.0 to 6.5 percentage points (approximately 23-50 percent lower than the White male business formation rate).

- For White women, from 2.6 to 2.9 percentage points (approximately 20-22 percent lower than the White male business formation rate).

To summarize for the construction sector results (Tables 45-47):

- For Blacks, the remaining difference ranges from 8.5 to 11.0 percentage points (approximately 33-43 percent lower than the corresponding White male business formation rate).

- For Hispanics, from 6.5 to 9.1 percentage points (approximately 25-35 percent lower than the White male business formation rate).

- For Asians, from 5.7 to 7.5 percentage points (approximately 22-29 percent lower than the White male business formation rate).

- For Native Americans, from 8.0 to 8.9 percentage points (approximately 31-35 percent lower than the White male business formation rate).

- For White women, from 4.8 to 9.9 percentage points (approximately 20-22 percent lower than the White male business formation rate).

c. Conclusions

This section has demonstrated that observed DBE availability levels in the State of Minnesota are substantially and statistically significantly lower than those that would be observed if commercial markets operated in a race- and sex-neutral manner. This suggests

that minorities and women are substantially and significantly less likely to own their own businesses as the result of discrimination than would be expected based upon their observable characteristics including age, education, geographic location, and industry. These groups also suffer substantial and significant earnings disadvantages relative to comparable White males whether they work as employees or as entrepreneurs.

D. Estimates of Adjusted DBE Availability

The Probit regression results for the Minnesota construction and architecture/engineering sector from Table 45 are combined with weighted average self-employment rates by race and sex from the 2000 PUMS (Table 41) to determine the expected difference between baseline availability and expected availability in a race-neutral marketplace. These figures appear in column (2) of Table 48.

Overall, the self-employment rate for minorities and women is 15.1 percent. According to the regression specification underlying Table 45, that rate would be 23.2 percent, or 54.6 percent higher, in a race- and sex-neutral marketplace. Put differently, the disparity ratio of the actual compared to the potential business formation rate is 65.1. Disparity ratios are large and statistically significant for all groups examined. The largest disparity observed is for Blacks (32.2), followed in descending order by that for Native Americans (44.8), Hispanics (60.2), White females (66.4), Asians (73.9), and Multiple races (84.9).

Given the large, adverse, and statistically significant disparities observed throughout Table 48, adjusted baseline estimates of DBE availability may be warranted to account for the continuing effects of discrimination, as directed by 49 CFR § 26.45(d)(1)(ii). It is important to note, however, that even the unadjusted baseline DBE availability figure is substantially higher than the average level of DBE utilization that Mn/DOT has achieved in recent fiscal years.[48]

Finally, Table 49 summarizes our estimates of baseline DBE availability and adjusted DBE availability for construction and consulting, separately as well as combined.

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[48] Some of this low utilization may be due to legal injunctions against the Mn/DOT DBE program in effect between _____ and _____. See also Section V, above.

VII. TABLES

Table 1. Product Market for All Mn/DOT Contracts

SIC Code	SIC Description	Percentage	Cumulative Percentage
1611	Highway and Street Construction	65.794	65.794
1731	Electrical Work	5.217	71.011
1771	Concrete Work	4.656	75.667
8711	Engineering Services	4.217	79.884
1542	Nonresidential Construction, n.e.c.	2.477	82.361
0783	Ornamental Shrub and Tree Services	2.055	84.416
1791	Structural Steel Erection	1.523	85.939
1629	Heavy Construction, n.e.c.	1.509	87.448
1794	Excavation Work	1.503	88.950
0782	Lawn and Garden Services	1.249	90.199
3272	Concrete Products, n.e.c.	0.837	91.037
5032	Brick, Stone, and Related Construction Materials	0.760	91.797
8712	Architectural Services	0.742	92.539
3993	Signs and Advertising Displays	0.626	93.165
4212	Local Trucking Without Storage	0.605	93.770
4213	Trucking, Except Local	0.605	94.375
1721	Painting	0.598	94.973
3441	Fabricated Structural Metal	0.454	95.427
3444	Sheet Metal Work	0.454	95.881
3446	Architectural Metal Work	0.454	96.336
5051	Metals Service Centers and Offices	0.433	96.768
1623	Water, Sewer, and Utility Lines	0.374	97.143
8713	Surveying Services	0.344	97.487
1711	Plumbing, Heating, and Air Conditioning	0.305	97.791
3669	Communications Equipment, n.e.c.	0.292	98.083
6531	Real Estate Agents and Managers	0.269	98.353
5063	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Materials	0.199	98.552
1799	Special Trade Contractors, n.e.c.	0.184	98.735
7359	Equipment Rental and Leasing, n.e.c.	0.180	98.915

SIC Code	SIC Description	Percentage	Cumulative Percentage
1442	Construction Sand and Gravel	0.164	99.080
8734	Testing Laboratories	0.131	99.211
1622	Bridge, Tunnel, and Elevated Highway	0.121	99.331
1741	Masonry and Other Stonework	0.117	99.448
7353	Heavy Construction Equipment Rental and Leasing	0.112	99.561
8731	Commercial Physical and Biological Research	0.096	99.657
5193	Flowers, Nursery Stock, and Florists' Supplies	0.088	99.745
1796	Installing Building Equipment, n.e.c.	0.077	99.821
3271	Concrete Brick and Block	0.067	99.889
5084	Industrial Machinery and Equipment	0.057	99.946
5031	Lumber, Plywood, Millwork, and Wood Panels	0.054	100.000
	TOTAL ($)	2,987,734,273	

Table 2. Product Market for Mn/DOT Construction Contracts

SIC Code	SIC Description	Percentage	Cumulative Percentage
1611	Highway and Street Construction	70.095	70.095
1731	Electrical Work	5.599	75.694
1771	Concrete Work	4.997	80.691
1542	Nonresidential Construction, n.e.c.	2.658	83.349
1791	Structural Steel Erection	1.634	84.983
1629	Heavy Construction, n.e.c.	1.619	86.602
1794	Excavation Work	1.612	88.215
0782	Lawn and Garden Services	1.341	89.555
0783	Ornamental Shrub and Tree Services	1.341	90.896
3272	Concrete Products, n.e.c.	0.898	91.795
5032	Brick, Stone, and Related Construction Materials	0.815	92.610
3993	Signs and Advertising Displays	0.672	93.281
4212	Local Trucking Without Storage	0.650	93.931
4213	Trucking, Except Local	0.650	94.581
1721	Painting	0.642	95.222
8711	Engineering Services	0.494	95.716
3441	Fabricated Structural Metal	0.487	96.204
3444	Sheet Metal Work	0.487	96.691
3446	Architectural Metal Work	0.487	97.178
5051	Metals Service Centers and Offices	0.464	97.643
1623	Water, Sewer, and Utility Lines	0.402	98.044
1711	Plumbing, Heating, and Air Conditioning	0.327	98.371
5063	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Materials	0.214	98.585
1799	Special Trade Contractors, n.e.c.	0.197	98.782
7359	Equipment Rental and Leasing, n.e.c.	0.193	98.975
1442	Construction Sand and Gravel	0.176	99.152
1622	Bridge, Tunnel, and Elevated Highway	0.130	99.281
1741	Masonry and Other Stonework	0.125	99.407
7353	Heavy Construction Equipment Rental and Leasing	0.120	99.527

SIC Code	SIC Description	Percentage	Cumulative Percentage
3669	Communications Equipment, n.e.c.	0.104	99.631
5193	Flowers, Nursery Stock, and Florists' Supplies	0.095	99.726
1796	Installing Building Equipment, n.e.c.	0.082	99.808
3271	Concrete Brick and Block	0.072	99.880
5084	Industrial Machinery and Equipment	0.061	99.942
5031	Lumber, Plywood, Millwork, and Wood Panels	0.058	100.000
	TOTAL ($)	2,761,316,327	

Table 3. Product Market for Mn/DOT Consulting Contracts

SIC Code	SIC Description	Percentage	Cumulative Percentage
8711	Engineering Services	55.131	55.131
0783	Ornamental Shrub and Tree Services	11.817	66.948
8712	Architectural Services	10.891	77.838
1611	Highway and Street Construction	6.974	84.812
8713	Surveying Services	5.047	89.858
6531	Real Estate Agents and Managers	3.954	93.812
3669	Communications Equipment, n.e.c.	2.858	96.670
8734	Testing Laboratories	1.922	98.593
8731	Commercial Physical and Biological Research	1.407	100.000
	TOTAL ($)	226,417,946	

Table 4. Distribution of Mn/DOT Contract Dollars by Category

Location	Construction (%)	Consulting (%)	Combined (%)
Inside Minnesota	89.4%	90.7%	89.5%
Outside Minnesota	10.6%	9.3%	10.5%
Metropolitan	71.1%	93.1%	72.6%
Non-Metropolitan	28.9%	6.9%	27.4%
Metro	50.8%	83.0%	53.1%
Brainerd/St. Cloud	11.4%	1.5%	10.7%
Duluth/Virginia	6.0%	4.1%	5.9%
Detroit Lakes/Morris	5.8%	0.5%	5.4%
Marshall/Hutchinson	5.1%	0.1%	4.8%
Mankato/Windom	4.7%	0.7%	4.4%
Rochester/Owatonna/Winona	2.9%	2.7%	2.9%
Bemidji/Crookston	2.7%	0.6%	2.5%
Outside MN	10.6%	6.7%	10.3%

Source: NERA calculations from Mn/DOT master contract/subcontract database.

Table 5. County Distribution of Mn/DOT Contract Dollars

Minnesota County	Construction (%)	Consulting (%)	Combined (%)
Aitkin	0.158		0.146
Anoka	1.167	1.187	1.168
Becker	0.525		0.487
Beltrami	1.586		1.473
Benton	3.781		3.511
Big Stone	0.033		0.031
Blue Earth	1.166	0.823	1.142
Brown	2.732		2.537
Carlton	1.862	0.042	1.732
Carver	0.101	0.001	0.094
Cass	0.03	0.005	0.028
Chippewa	0.079		0.074
Chisago	5.125		4.758
Clay	0.106		0.099
Cottonwood	0.021		0.02
Crow Wing	0.543		0.504
Dakota	18.192	2.177	17.046
Dodge	0.013		0.012
Douglas	2.889		2.682
Faribault	0.108		0.1
Fillmore	0.581		0.539
Freeborn	0.088		0.082
Goodhue	0.181		0.168
Grant	0		0
Hennepin	26.884	66.537	29.72
Houston	0.066	0.168	0.073
Hubbard	0.585		0.543
Isanti	0.008		0.007
Itasca	1.3		1.207
Jackson	0.149		0.138

Minnesota County	Construction (%)	Consulting (%)	Combined (%)
Kanabec	0.631		0.586
Kandiyohi	3.078	0.081	2.863
Kittson	0		0
Koochiching	0.14		0.13
Lac Qui Parle	0.007		0.006
Lake	0		0
Le Sueur	0.569		0.528
Lyon	1.94		1.801
Marshall	0.452		0.419
Martin	0.429		0.399
McLeod	0.198		0.184
Meeker	0.161		0.149
Mille Lacs	0.052		0.048
Morrison	0.475		0.441
Mower	0.022		0.02
Murray	0.169		0.157
Nicollet	0.003		0.003
Nobles	0.064		0.06
Olmsted	0.588	2.793	0.746
Otter Tail	1.393	0.148	1.304
Pennington	0.045		0.041
Pine	0.149		0.139
Pipestone	0.004		0.003
Polk	0.275	0.646	0.302
Pope	0.608		0.565
Ramsey	1.902	21.17	3.281
Red Lake	0.04	0.057	0.041
Redwood	0.087		0.081
Renville	0		0
Rice	0.561		0.521
Rock	0.001		0.001

Minnesota County	Construction (%)	Consulting (%)	Combined (%)
Roseau	0.015		0.014
Saint Louis	3.091	2.184	3.027
Scott	1.404	0.23	1.32
Sherburne	0.517	0.84	0.54
Sibley	0.004		0.004
Stearns	1.464	0.274	1.379
Steele	0.723		0.671
Stevens	0.919	0.319	0.876
Swift	0.027		0.025
Traverse	0.023		0.022
Wabasha	0.001		0.001
Wadena	0.192		0.179
Waseca	0.003		0.003
Washington	2.07	0.273	1.941
Watonwan	0		0
Wilkin	0		0
Winona	0.405		0.376
Wright	5.042	0.045	4.685
Yellow Medicine	0		0
TOTAL	100.000	100.000	100.000

Source: NERA calculations from Mn/DOT contracts databases.

Table 6. Total Businesses and Industry Weight, by SIC Code

SIC Code	SIC Description	Number of Establishments	Industry Weight	Industry Weight (Cumulative)
1611	Highway and Street Construction	501	65.794	65.794
1731	Electrical Work	2009	5.217	71.011
1771	Concrete Work	930	4.656	75.667
8711	Engineering Services	1193	4.217	79.884
1542	Nonresidential Construction, n.e.c.	1243	2.477	82.361
0783	Ornamental Shrub and Tree Services	441	2.055	84.416
1791	Structural Steel Erection	55	1.523	85.939
1629	Heavy Construction, n.e.c.	304	1.509	87.448
1794	Excavation Work	1134	1.503	88.950
0782	Lawn and Garden Services	1818	1.249	90.199
3272	Concrete Products, n.e.c.	102	0.837	91.037
5032	Brick, Stone, and Related Construction Materials	226	0.760	91.797
8712	Architectural Services	558	0.742	92.539
3993	Signs and Advertising Displays	582	0.626	93.165
4212	Local Trucking Without Storage	2182	0.605	93.770
4213	Trucking, Except Local	1322	0.605	94.375
1721	Painting	1620	0.598	94.973
3441	Fabricated Structural Metal	164	0.454	95.427
3444	Sheet Metal Work	238	0.454	95.881
3446	Architectural Metal Work	67	0.454	96.336
5051	Metals Service Centers and Offices	198	0.433	96.768
1623	Water, Sewer, and Utility Lines	307	0.374	97.143
8713	Surveying Services	139	0.344	97.487
1711	Plumbing, Heating, and Air Conditioning	2692	0.305	97.791
3669	Communications Equipment, n.e.c.	32	0.292	98.083
6531	Real Estate Agents and Managers	537	0.269	98.353
5063	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Materials	443	0.199	98.552
1799	Special Trade Contractors, n.e.c.	1978	0.184	98.735
7359	Equipment Rental and Leasing, n.e.c.	823	0.180	98.915

SIC Code	SIC Description	Number of Establishments	Industry Weight	Industry Weight (Cumulative)
1442	Construction Sand and Gravel	84	0.164	99.080
8734	Testing Laboratories	179	0.131	99.211
1622	Bridge, Tunnel, and Elevated Highway	28	0.121	99.331
1741	Masonry and Other Stonework	753	0.117	99.448
7353	Heavy Construction Equipment Rental and Leasing	66	0.112	99.561
8731	Commercial Physical and Biological Research	245	0.096	99.657
5193	Flowers, Nursery Stock, and Florists' Supplies	134	0.088	99.745
1796	Installing Building Equipment, n.e.c.	56	0.077	99.821
3271	Concrete Brick and Block	29	0.067	99.889
5084	Industrial Machinery and Equipment	1129	0.057	99.946
5031	Lumber, Plywood, Millwork, and Wood Panels	438	0.054	100.000
	TOTAL	26,979		

Table 7. Construction Businesses and Industry Weight, by SIC Code

SIC Code	SIC Description	Number of Establish-ments	Industry Weight	Industry Weight (Cumu-lative)
1611	Highway and Street Construction	501	70.095	70.095
1731	Electrical Work	2009	5.599	75.694
1771	Concrete Work	930	4.997	80.691
1542	Nonresidential Construction, n.e.c.	1243	2.658	83.349
1791	Structural Steel Erection	55	1.634	84.983
1629	Heavy Construction, n.e.c.	304	1.619	86.602
1794	Excavation Work	1134	1.612	88.215
0782	Lawn and Garden Services	1818	1.341	89.555
0783	Ornamental Shrub and Tree Services	441	1.341	90.896
3272	Concrete Products, n.e.c.	102	0.898	91.795
5032	Brick, Stone, and Related Construction Materials	226	0.815	92.610
3993	Signs and Advertising Displays	582	0.672	93.281
4212	Local Trucking Without Storage	2182	0.650	93.931
4213	Trucking, Except Local	1322	0.650	94.581
1721	Painting	1620	0.642	95.222
8711	Engineering Services	1193	0.494	95.716
3441	Fabricated Structural Metal	164	0.487	96.204
3444	Sheet Metal Work	238	0.487	96.691
3446	Architectural Metal Work	67	0.487	97.178
5051	Metals Service Centers and Offices	198	0.464	97.643
1623	Water, Sewer, and Utility Lines	307	0.402	98.044
1711	Plumbing, Heating, and Air Conditioning	2692	0.327	98.371
5063	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Materials	443	0.214	98.585
1799	Special Trade Contractors, n.e.c.	1978	0.197	98.782
7359	Equipment Rental and Leasing, n.e.c.	823	0.193	98.975
1442	Construction Sand and Gravel	84	0.176	99.152
1622	Bridge, Tunnel, and Elevated Highway	28	0.130	99.281
1741	Masonry and Other Stonework	753	0.125	99.407
7353	Heavy Construction Equipment Rental and Leasing	66	0.120	99.527

SIC Code	SIC Description	Number of Estab- lish- ments	Industry Weight	Industry Weight (Cumu- lative)
3669	Communications Equipment, n.e.c.	32	0.104	99.631
5193	Flowers, Nursery Stock, and Florists' Supplies	134	0.095	99.726
1796	Installing Building Equipment, n.e.c.	56	0.082	99.808
3271	Concrete Brick and Block	29	0.072	99.880
5084	Industrial Machinery and Equipment	1129	0.061	99.942
5031	Lumber, Plywood, Millwork, and Wood Panels	438	0.058	100.000
	TOTAL	25,321		

Table 8. Consulting Businesses and Industry Weight, by SIC Code

SIC Code	SIC Description	Number of Establish-ments	Industry Weight	Industry Weight (Cumu-lative)
8711	Engineering Services	1193	55.131	55.131
0783	Ornamental Shrub and Tree Services	441	11.817	66.948
8712	Architectural Services	558	10.891	77.838
1611	Highway and Street Construction	501	6.974	84.812
8713	Surveying Services	139	5.047	89.858
6531	Real Estate Agents and Managers	537	3.954	93.812
3669	Communications Equipment, n.e.c.	32	2.858	96.670
8734	Testing Laboratories	179	1.922	98.593
8731	Commercial Physical and Biological Research	245	1.407	100.000
	TOTAL	3,825		

Table 9. Listed DBEs and Industry Weight, by SIC Code

SIC Code	SIC Description	Number of Establish-ments	Industry Weight	Industry Weight (Cumu-lative)
1611	Highway and Street Construction	30	65.794	65.794
1731	Electrical Work	140	5.217	71.011
1771	Concrete Work	48	4.656	75.667
8711	Engineering Services	99	4.217	79.884
1542	Nonresidential Construction, n.e.c.	70	2.477	82.361
0783	Ornamental Shrub and Tree Services	16	2.055	84.416
1791	Structural Steel Erection	9	1.523	85.939
1629	Heavy Construction, n.e.c.	15	1.509	87.448
1794	Excavation Work	57	1.503	88.950
0782	Lawn and Garden Services	131	1.249	90.199
3272	Concrete Products, n.e.c.	4	0.837	91.037
5032	Brick, Stone, and Related Construction Materials	17	0.760	91.797
8712	Architectural Services	61	0.742	92.539
3993	Signs and Advertising Displays	85	0.626	93.165
4212	Local Trucking Without Storage	125	0.605	93.770
4213	Trucking, Except Local	78	0.605	94.375
1721	Painting	117	0.598	94.973
3441	Fabricated Structural Metal	13	0.454	95.427
3444	Sheet Metal Work	19	0.454	95.881
3446	Architectural Metal Work	8	0.454	96.336
5051	Metals Service Centers and Offices	15	0.433	96.768
1623	Water, Sewer, and Utility Lines	27	0.374	97.143
8713	Surveying Services	14	0.344	97.487
1711	Plumbing, Heating, and Air Conditioning	114	0.305	97.791
3669	Communications Equipment, n.e.c.	10	0.292	98.083
6531	Real Estate Agents and Managers	59	0.269	98.353
5063	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Materials	37	0.199	98.552
1799	Special Trade Contractors, n.e.c.	127	0.184	98.735
7359	Equipment Rental and Leasing, n.e.c.	79	0.180	98.915

SIC Code	SIC Description	Number of Estab-lish-ments	Industry Weight	Industry Weight (Cumu-lative)
1442	Construction Sand and Gravel	1	0.164	99.080
8734	Testing Laboratories	26	0.131	99.211
1622	Bridge, Tunnel, and Elevated Highway	4	0.121	99.331
1741	Masonry and Other Stonework	36	0.117	99.448
7353	Heavy Construction Equipment Rental and Leasing	7	0.112	99.561
8731	Commercial Physical and Biological Research	27	0.096	99.657
5193	Flowers, Nursery Stock, and Florists' Supplies	21	0.088	99.745
1796	Installing Building Equipment, n.e.c.	2	0.077	99.821
3271	Concrete Brick and Block	0	0.067	99.889
5084	Industrial Machinery and Equipment	73	0.057	99.946
5031	Lumber, Plywood, Millwork, and Wood Panels	27	0.054	100.000
	TOTAL	1,848		

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Table 10. Listed Construction DBEs & Industry Weight, by SIC Code

SIC Code	SIC Description	Number of Establishments	Industry Weight	Industry Weight (Cumulative)
1611	Highway and Street Construction	30	70.095	70.095
1731	Electrical Work	140	5.599	75.694
1771	Concrete Work	48	4.997	80.691
1542	Nonresidential Construction, n.e.c.	70	2.658	83.349
1791	Structural Steel Erection	9	1.634	84.983
1629	Heavy Construction, n.e.c.	15	1.619	86.602
1794	Excavation Work	57	1.612	88.215
0782	Lawn and Garden Services	131	1.341	89.555
0783	Ornamental Shrub and Tree Services	16	1.341	90.896
3272	Concrete Products, n.e.c.	4	0.898	91.795
5032	Brick, Stone, and Related Construction Materials	17	0.815	92.610
3993	Signs and Advertising Displays	85	0.672	93.281
4212	Local Trucking Without Storage	125	0.650	93.931
4213	Trucking, Except Local	78	0.650	94.581
1721	Painting	117	0.642	95.222
8711	Engineering Services	99	0.494	95.716
3441	Fabricated Structural Metal	13	0.487	96.204
3444	Sheet Metal Work	19	0.487	96.691
3446	Architectural Metal Work	8	0.487	97.178
5051	Metals Service Centers and Offices	15	0.464	97.643
1623	Water, Sewer, and Utility Lines	27	0.402	98.044
1711	Plumbing, Heating, and Air Conditioning	114	0.327	98.371
5063	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Materials	37	0.214	98.585
1799	Special Trade Contractors, n.e.c.	127	0.197	98.782
7359	Equipment Rental and Leasing, n.e.c.	79	0.193	98.975
1442	Construction Sand and Gravel	1	0.176	99.152
1622	Bridge, Tunnel, and Elevated Highway	4	0.130	99.281
1741	Masonry and Other Stonework	36	0.125	99.407
7353	Heavy Construction Equipment Rental and Leasing	7	0.120	99.527

SIC Code	SIC Description	Number of Establish-ments	Industry Weight	Industry Weight (Cumu-lative)
3669	Communications Equipment, n.e.c.	10	0.104	99.631
5193	Flowers, Nursery Stock, and Florists' Supplies	21	0.095	99.726
1796	Installing Building Equipment, n.e.c.	2	0.082	99.808
3271	Concrete Brick and Block	0	0.072	99.880
5084	Industrial Machinery and Equipment	73	0.061	99.942
5031	Lumber, Plywood, Millwork, and Wood Panels	27	0.058	100.000
	TOTAL	1,661		

NERA
Economic Consulting

Table 11. Listed Consulting DBEs & Industry Weight, by SIC Code

SIC Code	SIC Description	Number of Establishments	Industry Weight	Industry Weight (Cumulative)
8711	Engineering Services	99	55.131	55.131
0783	Ornamental Shrub and Tree Services	16	11.817	66.948
8712	Architectural Services	61	10.891	77.838
1611	Highway and Street Construction	30	6.974	84.812
8713	Surveying Services	14	5.047	89.858
6531	Real Estate Agents and Managers	59	3.954	93.812
3669	Communications Equipment, n.e.c.	10	2.858	96.670
8734	Testing Laboratories	26	1.922	98.593
8731	Commercial Physical and Biological Research	27	1.407	100.000
	TOTAL	342		

Table 12. Listed DBE Percentage and Industry Weight, by SIC Code

SIC Code	SIC Description	Percen-tage	Industry Weight	Industry Weight (Cumu-lative)
1611	Highway and Street Construction	6.0%	65.794	65.794
1731	Electrical Work	7.0%	5.217	71.011
1771	Concrete Work	5.2%	4.656	75.667
8711	Engineering Services	8.3%	4.217	79.884
1542	Nonresidential Construction, n.e.c.	5.6%	2.477	82.361
0783	Ornamental Shrub and Tree Services	3.6%	2.055	84.416
1791	Structural Steel Erection	16.4%	1.523	85.939
1629	Heavy Construction, n.e.c.	4.9%	1.509	87.448
1794	Excavation Work	5.0%	1.503	88.950
0782	Lawn and Garden Services	7.2%	1.249	90.199
3272	Concrete Products, n.e.c.	3.9%	0.837	91.037
5032	Brick, Stone, and Related Construction Materials	7.5%	0.760	91.797
8712	Architectural Services	10.9%	0.742	92.539
3993	Signs and Advertising Displays	14.6%	0.626	93.165
4212	Local Trucking Without Storage	5.7%	0.605	93.770
4213	Trucking, Except Local	5.9%	0.605	94.375
1721	Painting	7.2%	0.598	94.973
3441	Fabricated Structural Metal	7.9%	0.454	95.427
3444	Sheet Metal Work	8.0%	0.454	95.881
3446	Architectural Metal Work	11.9%	0.454	96.336
5051	Metals Service Centers and Offices	7.6%	0.433	96.768
1623	Water, Sewer, and Utility Lines	8.8%	0.374	97.143
8713	Surveying Services	10.1%	0.344	97.487
1711	Plumbing, Heating, and Air Conditioning	4.2%	0.305	97.791
3669	Communications Equipment, n.e.c.	31.3%	0.292	98.083
6531	Real Estate Agents and Managers	11.0%	0.269	98.353
5063	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Materials	8.4%	0.199	98.552
1799	Special Trade Contractors, n.e.c.	6.4%	0.184	98.735
7359	Equipment Rental and Leasing, n.e.c.	9.6%	0.180	98.915

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SIC Code	SIC Description	Percen-tage	Industry Weight	Industry Weight (Cumu-lative)
1442	Construction Sand and Gravel	1.2%	0.164	99.080
8734	Testing Laboratories	14.5%	0.131	99.211
1622	Bridge, Tunnel, and Elevated Highway	14.3%	0.121	99.331
1741	Masonry and Other Stonework	4.8%	0.117	99.448
7353	Heavy Construction Equipment Rental and Leasing	10.6%	0.112	99.561
8731	Commercial Physical and Biological Research	11.0%	0.096	99.657
5193	Flowers, Nursery Stock, and Florists' Supplies	15.7%	0.088	99.745
1796	Installing Building Equipment, n.e.c.	3.6%	0.077	99.821
3271	Concrete Brick and Block	0.0%	0.067	99.889
5084	Industrial Machinery and Equipment	6.5%	0.057	99.946
5031	Lumber, Plywood, Millwork, and Wood Panels	6.2%	0.054	100.000
	TOTAL	6.8%		

Table 13. Listed Construction DBE Percentage & Industry Weight, by SIC Code

SIC Code	SIC Description	Percent-age	Industry Weight	Industry Weight (Cumu-lative)
1611	Highway and Street Construction	6.0%	70.095	70.095
1731	Electrical Work	7.0%	5.599	75.694
1771	Concrete Work	5.2%	4.997	80.691
1542	Nonresidential Construction, n.e.c.	5.6%	2.658	83.349
1791	Structural Steel Erection	16.4%	1.634	84.983
1629	Heavy Construction, n.e.c.	4.9%	1.619	86.602
1794	Excavation Work	5.0%	1.612	88.215
0782	Lawn and Garden Services	7.2%	1.341	89.555
0783	Ornamental Shrub and Tree Services	3.6%	1.341	90.896
3272	Concrete Products, n.e.c.	3.9%	0.898	91.795
5032	Brick, Stone, and Related Construction Materials	7.5%	0.815	92.610
3993	Signs and Advertising Displays	14.6%	0.672	93.281
4212	Local Trucking Without Storage	5.7%	0.650	93.931
4213	Trucking, Except Local	5.9%	0.650	94.581
1721	Painting	7.2%	0.642	95.222
8711	Engineering Services	8.3%	0.494	95.716
3441	Fabricated Structural Metal	7.9%	0.487	96.204
3444	Sheet Metal Work	8.0%	0.487	96.691
3446	Architectural Metal Work	11.9%	0.487	97.178
5051	Metals Service Centers and Offices	7.6%	0.464	97.643
1623	Water, Sewer, and Utility Lines	8.8%	0.402	98.044
1711	Plumbing, Heating, and Air Conditioning	4.2%	0.327	98.371
5063	Electrical Apparatus and Equipment, Wiring Supplies, and Construction Materials	8.4%	0.214	98.585
1799	Special Trade Contractors, n.e.c.	6.4%	0.197	98.782
7359	Equipment Rental and Leasing, n.e.c.	9.6%	0.193	98.975
1442	Construction Sand and Gravel	1.2%	0.176	99.152
1622	Bridge, Tunnel, and Elevated Highway	14.3%	0.130	99.281
1741	Masonry and Other Stonework	4.8%	0.125	99.407

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SIC Code	SIC Description	Percent-age	Industry Weight	Industry Weight (Cumu-lative)
7353	Heavy Construction Equipment Rental and Leasing	10.6%	0.120	99.527
3669	Communications Equipment, n.e.c.	31.3%	0.104	99.631
5193	Flowers, Nursery Stock, and Florists' Supplies	15.7%	0.095	99.726
1796	Installing Building Equipment, n.e.c.	3.6%	0.082	99.808
3271	Concrete Brick and Block	0.0%	0.072	99.880
5084	Industrial Machinery and Equipment	6.5%	0.061	99.942
5031	Lumber, Plywood, Millwork, and Wood Panels	6.2%	0.058	100.000
	TOTAL	6.6%		

Table 14. Listed Consulting DBE Percentage & Industry Weight, by SIC Code

SIC Code	SIC Description	Percen-tage	Industry Weight	Industry Weight (Cumu-lative)
8711	Engineering Services	8.3%	55.131	55.131
0783	Ornamental Shrub and Tree Services	3.6%	11.817	66.948
8712	Architectural Services	10.9%	10.891	77.838
1611	Highway and Street Construction	6.0%	6.974	84.812
8713	Surveying Services	10.1%	5.047	89.858
6531	Real Estate Agents and Managers	11.0%	3.954	93.812
3669	Communications Equipment, n.e.c.	31.3%	2.858	96.670
8734	Testing Laboratories	14.5%	1.922	98.593
8731	Commercial Physical and Biological Research	11.0%	1.407	100.000
	TOTAL	8.9%		

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Table 15. Putative DBE Survey—Amount of Misclassification

Putative Race/Sex	Percentage White Male	Percentage Other DBE Type	Percentage Correctly Classified	Number of Businesses Interviewed
White Female	23.8	4.0	72.2	1,147
Black (either sex)	17.0	7.5	75.5	200
Hispanic (either sex)	38.0	8.2	53.8	292
Asian (either sex)	18.7	7.8	73.5	219
Native American (either sex)	27.5	7.7	64.8	91
Unspecified Minority (either sex)	20.0	80.0	0.0	20
All DBE Types	24.8	6.3	68.9	1,969

Table 16. Putative Non- DBE Survey—Amount of Misclassification

Putative Race/Sex	Percentage White Female	Percentage Minority	Percentage Correctly Classified	Number of Businesses Interviewed
White Male	8.3	2.8	88.9	4,399

Table 17. Calculation Summary—Overall

Step / Calculation	Number of Businesses	Percentage of Total
All Businesses	26,979	100.00
Listed DBEs	1,848	6.85
Listed DBEs (with industry weights)	1,714	6.35
Listed DBEs (corrected for misclassification)	1,410	5.23
Listed DBEs (corrected for misclassif.; with industry weights)	1,415	5.24
Unlisted DBEs (corrected for misclassification)	2,799	10.37
Unlisted DBEs (corrected for misclassif.; with industry weights)	2,712	10.05
All DBEs (final, unweighted)	4,209	15.60
All DBEs (final, with industry weights)	4,127	*15.30*

Table 18. Calculation Summary—Construction

Step / Calculation	Number of Businesses	Percentage of Total
All Businesses	25,321	100.00
Listed DBEs	1,661	6.6
Listed DBEs (with industry weights)	1,564	6.2
Listed DBEs (corrected for misclassification)	1,266	5.00
Listed DBEs (corrected for misclassif.; with industry weights)	1,271	5.02
Unlisted DBEs (corrected for misclassification)	2,636	10.41
Unlisted DBEs (corrected for misclassif.; with industry weights)	2,572	10.16
All DBEs (final, unweighted)	3,902	15.41
All DBEs (final, with industry weights)	3,843	*15.18*

Table 19. Calculation Summary—Consulting

Step / Calculation	Number of Businesses	Percentage of Total
All Businesses	3,825	100.00
Listed DBEs	342	8.94
Listed DBEs (with industry weights)	315	8.25
Listed DBEs (corrected for misclassification)	263	6.88
Listed DBEs (corrected for misclassif.; with industry weights)	264	6.90
Unlisted DBEs (corrected for misclassification)	940	6.42
Unlisted DBEs (corrected for misclassif.; with industry weights)	942	6.43
All DBEs (final, unweighted)	651	17.01
All DBEs (final, with industry weights)	634	*16.58*

Table 20. Estimated DBE Availability for Mn/DOT

Geographic Region	Overall	Construction	Consulting
Metro	16.57	16.36	17.79
Brainerd/St. Cloud	13.61	13.54	15.18
Duluth/Virginia	16.94	17.16	13.22
Detroit Lakes/Morris	15.69	15.78	13.20
Marshall/Hutchinson	12.14	12.03	15.05
Mankato/Windom	14.38	14.41	13.63
Rochester/Owatonna/Winona	12.67	12.63	13.34
Bemidji/Crookston	16.83	16.82	17.06
White Male	84.70	84.82	83.42
White Female	11.33	11.28	11.86
Black	0.90	0.88	1.18
Hispanic	0.70	0.70	0.76
Asian	1.40	1.35	1.96
Native American	0.95	0.97	0.82
MBE	3.96	3.89	4.72
DBE	15.30	15.18	16.58
ENTIRE GEOGRAPHIC MARKET AREA	*15.30*	*15.18*	*16.58*

Source: (i) NERA calculations from master Mn/DOT contract/subcontract database; (ii) Dun & Bradstreet's *MarketPlace*; (iii) business directory information compiled by NERA; and (iv) NERA telephone surveys.

Table 21. Estimated DBE Utilization on Mn/DOT Construction Projects—Federally-Assisted Only, Prime Contracts Only, Gross Contract Amount

Type	Contracts		Contract Dollars	
	%	N	%	$
White Male	99.23	774	99.71	2,753,344,158
White Female	0.64	5	0.25	6,891,111
Black	0.00	0	0.00	0
Hispanic	0.00	0	0.00	0
Asian/Pacific	0.00	0	0.00	0
Native American	0.13	1	0.04	1,081,045
All MBE	0.13	1	0.04	1,081,045
All DBE	0.77	6	0.29	7,972,156
TOTAL	100.00	780	100.00	2,761,316,314

Table 22. Estimated DBE Utilization on Mn/DOT Construction Projects—Federally-Assisted Only, Prime Contracts Only, Non-Subcontracted Dollar Amounts

Type	Contracts		Contract Dollars	
	%	N	%	$
White Male	99.23	774	99.77	1,656,708,236
White Female	0.64	5	0.20	3,253,909
Black	0.00	0	0.00	0
Hispanic	0.00	0	0.00	0
Asian/Pacific	0.00	0	0.00	0
Native American	0.13	1	0.04	587,902
All MBE	0.13	1	0.04	587,902
All DBE	0.77	6	0.24	3,841,811
TOTAL	100.00	780	100.00	1,660,550,047

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**Table 23. Estimated DBE Utilization on Mn/DOT Construction
Projects—Federally-Assisted Only, Prime and Subcontracts,
First-Tier Only**

Type	Contracts		Contract Dollars	
	%	N	%	$
White Male	84.60	5,995	94.45	2,608,077,350
White Female	10.75	762	3.71	102,517,492
Black	0.69	49	0.54	14,796,906
Hispanic	0.78	55	0.45	12,521,389
Asian/Pacific	2.55	181	0.46	12,838,622
Native American	0.62	44	0.38	10,564,568
All MBE	4.65	329	1.84	50,721,485
All DBE	15.40	1,091	5.55	153,238,977
TOTAL	100.00	7,086	100.00	2,761,316,327

Table 24. Estimated DBE Utilization on Mn/DOT Construction Projects—Non-Federally-Assisted Only, Prime Contracts Only, Gross Contract Amount

Type	Contracts		Contract Dollars	
	%	N	%	N
White Male	95.54	621	97.49	502,109,104
White Female	4.31	28	2.48	12,762,701
Black	0	0	0.00	0
Hispanic	0	0	0.00	0
Asian/Pacific	0	0	0.00	0
Native American	0.15	1	0.03	157,632
All MBE	0.15	1	0.03	157,632
All DBE	4.46	29	2.51	12,920,333
TOTAL	100.00	650	100.00	515,029,437

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**Table 25. Estimated DBE Utilization on Mn/DOT Construction
Projects—Non-Federally-Assisted Only, Prime Contracts Only,
Non-Subcontracted Dollar Amounts**

Type	Contracts		Contract Dollars	
	%	N	%	N
White Male	95.54	621	97.21	430,232,160
White Female	4.31	28	2.75	12,187,125
Black	0	0	0.00	0
Hispanic	0	0	0.00	0
Asian/Pacific	0	0	0.00	0
Native American	0.15	1	0.04	157,632
All MBE	0.15	1	0.04	157,632
All DBE	4.46	29	2.79	12,344,757
TOTAL	100.00	650	100.00	442,576,917

**Table 26. Estimated DBE Utilization on Mn/DOT Construction
Projects—Non-Federally-Assisted Only, Prime and Subcontracts,
First-Tier Only**

Type	Contracts		Contract Dollars	
	%	N	%	N
White Male	94.25	1,525	97.08	499,973,693
White Female	4.94	80	2.70	13,921,472
Black	0.19	3	0.05	260,391
Hispanic	0.12	2	0.00	12,254
Asian/Pacific	0.31	5	0.13	678,860
Native American	0.19	3	0.04	182,767
All MBE	0.81	13	0.22	1,134,272
All DBE	5.75	93	2.92	15,055,745
TOTAL	100.00	1,618	100.00	515,029,437

**Table 27. Estimated DBE Utilization on Mn/DOT Consulting Projects—
Federally-Assisted Only, Prime Contracts Only, Gross Contract
Amount**

Type	Contracts		Contract Dollars	
	%	N	%	N
White Male	96.60	3,613	98.17	222,268,110
DBE	3.40	127	1.83	4,149,835
TOTAL	100.00	3,740	100.00	226,417,946

Table 28. Annual Wage Earnings Regressions, All Industries, 2000

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.297	-0.297	-0.297
	(182.46)	(182.08)	(182.45)
Hispanic	-0.213	-0.214	-0.214
	(131.32)	(131.32)	(131.35)
Asian/Pacific Islanders	-0.290	-0.291	-0.291
	(132.65)	(132.55)	(132.52)
Native American	-0.325	-0.325	-0.325
	(67.14)	(66.43)	(66.41)
Other Race	-0.281	-0.282	-0.281
	(86.1)	(85.64)	(86.13)
White Female	-0.358	-0.358	-0.358
	(388.14)	(384.28)	(384.33)
Age	0.178	0.178	0.178
	(654.69)	(654.69)	(654.69)
Age^2	-0.002	-0.002	-0.002
	(565.27)	(565.27)	(565.27)
Minnesota	-0.059	-0.069	-0.066
	(0.00)	(0.00)	(0.00)
Minnesota*Black		0.012	
		(0.43)	
Minnesota*Hispanic		0.098	
		(3.98)	
Minnesota* Asian/Pacific Islanders		0.143	0.139
		(5.35)	(5.21)
Minnesota* Native American		0.028	0.024
		(0.72)	(0.62)
Minnesota*Other Race		0.012	
		(0.36)	
Minnesota*White Female		0.016	0.012
		(2.44)	(1.90)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	3510329	3510329	3510329
R^2	.441	.441	.441
F	17225	16607	16911

Source: NERA calculations from the 2000 Decennial Census Five Percent Public Use Microdata Samples.

Notes: (1) Universe is all private sector prime age wage and salary workers between age 16 and 64; observations with imputed values to the dependent variable and all independent variables are excluded; (2) Reported number is the percentage difference in annual wages between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes persons identifying themselves as belonging in more than one racial category; (5) Geography is defined based on place of residence.

Table 29. Annual Wage Earnings Regressions, All Industries, 1979-1991

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.220	-0.220	-0.220
	(205.27)	(204.89)	(205.27)
Hispanic	-0.167	-0.167	-0.167
	(122.92)	(122.75)	(122.92)
Other Race	-0.194	-0.194	-0.194
	(109.06)	(108.56)	(109.06)
White Female	-0.238	-0.238	-0.238
	(370.55)	(367.55)	(370.55)
Age	0.057	0.057	0.057
	(351.86)	(351.86)	(351.86)
Age^2	-0.001	-0.001	-0.001
	(286.2)	(286.2)	(286.2)
Minnesota	-0.112	-0.109	-0.112
	(27.25)	(23.38)	(27.25)
Minnesota*Black		0.020	
		(0.93)	
Minnesota*Hispanic		0.015	
		(0.45)	
Minnesota*Other Race		-0.002	
		(0.12)	
Minnesota*White Female		-0.006	
		(1.26)	
Time (13 categories)	Yes	Yes	Yes
Education (continuous)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (49 categories)	Yes	Yes	Yes
N	1868379	1868379	1868379
R^2	.504	.504	.504
F	16243	15706	16243

Source: NERA calculations from the Merged Outgoing Rotation Groups of the 1979-1991 Current Population Survey microdata samples.

Notes: (1) Universe is all private sector prime age wage and salary workers between age 16 and 64; observations with imputed earnings are excluded where identified; (2) Reported number is the percentage difference in annual wages between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 30. Annual Wage Earnings Regressions, All Industries, 1992-2002

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.214	-0.214	-0.214
	(129.51)	(129.51)	(129.5)
Hispanic	-0.206	-0.206	-0.206
	(118.35)	(118.46)	(118.44)
Asian	-0.194	-0.194	-0.194
	(78.96)	(78.73)	(79.01)
Native American	-0.171	-0.171	-0.171
	(38.05)	(37.84)	(38.07)
White Female	-0.178	-0.179	-0.179
	(174.59)	(173.45)	(173.46)
Age	0.053	0.053	0.053
	(202.35)	(202.36)	(202.36)
Age^2	-0.001	-0.001	-0.001
	(166.92)	(166.92)	(166.92)
Minnesota	-0.092	-0.107	-0.105
	(15.17)	(15.3)	(15.23)
Minnesota*Black		0.102	0.100
		(3.78)	(3.71)
Minnesota*Hispanic		0.126	0.124
		(4.85)	(4.77)
Minnesota*Asian		0.046	
		(1.86)	
Minnesota*Native American		0.006	
		(0.14)	
Minnesota*White Female		0.023	0.021
		(3.15)	(2.91)
Time (11 categories)	Yes	Yes	Yes
Education (continuous)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (49 categories)	Yes	Yes	Yes
N	933024	933024	933024
R^2	.467	.467	.467
F	6372	6133	6226

Source: NERA calculations from the Merged Outgoing Rotation Groups of the 1992-2002 Current Population Survey microdata samples.

Notes: (1) Universe is all private sector prime age wage and salary workers between age 16 and 64; observations with imputed earnings are excluded where identified; (2) Reported number is the percentage difference in annual wages between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 31. Annual Wage Earnings Regressions, Construction and Related Industries, 2000

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.325	-0.325	-0.325
	(48.39)	(48.32)	(48.36)
Hispanic	-0.156	-0.156	-0.156
	(30.35)	(30.27)	(30.31)
Asian/Pacific Islanders	-0.194	-0.194	-0.193
	(17.22)	(17.19)	(17.2)
Native American	-0.293	-0.292	-0.293
	(21.58)	(21.31)	(21.58)
Other Race	-0.211	-0.209	-0.211
	(17.81)	(17.56)	(17.79)
White Female	-0.399	-0.398	-0.398
	(103.04)	(101.61)	(101.62)
Age	0.158	0.158	0.158
	(169.33)	(169.34)	(169.34)
Age^2	-0.002	-0.002	-0.002
	(144.02)	(144.03)	(144.03)
Minnesota	0.278	0.291	0.290
	(7.45)	(7.67)	(7.68)
Minnesota*Black		0.110	
		(0.71)	
Minnesota*Hispanic		0.025	
		(0.29)	
Minnesota* Asian/Pacific Islanders		0.082	
		(0.48)	
Minnesota* Native American		-0.025	
		(0.22)	
Minnesota*Other Race		-0.204	
		(1.61)	
Minnesota*White Female		-0.083	-0.083
		(2.56)	(2.56)
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	280323	280323	280323
R^2	.276	.276	.276
F	1442	1334	1368

Source: See Table 28.

Notes: (1) Universe is all private sector prime age wage and salary workers between age 16 and 64 employed in the construction or construction-related professional services industries; observations with imputed values to the dependent variable and all independent variables are excluded; (2) Reported number is the percentage difference in annual wages between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes persons identifying themselves as belonging in more than one racial category; (5) Geography is defined based on place of residence.

Table 32. Annual Wage Earnings Regressions, Construction and Related Industries, 1979-1991

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.204	-0.204	-0.204
	(44.49)	(44.45)	(44.45)
Hispanic	-0.134	-0.134	-0.134
	(27.1)	(27)	(27.05)
Other Race	-0.091	-0.090	-0.091
	(11.76)	(11.65)	(11.74)
White Female	-0.308	-0.307	-0.307
	(95.02)	(93.82)	(93.83)
Age	0.073	0.073	0.073
	(112.45)	(112.45)	(112.45)
Age^2	-0.001	-0.001	-0.001
	(89.75)	(89.75)	(89.75)
Minnesota	-0.014	0.003	0.002
	(0.81)	(0.15)	(0.11)
Minnesota*Black		0.247	
		(0.96)	
Minnesota*Hispanic		-0.094	
		(0.70)	
Minnesota*Other Race		-0.065	
		(0.67)	
Minnesota*White Female		-0.140	-0.139
		(4.63)	(4.61)
Time (13 categories)	Yes	Yes	Yes
Education (continuous)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (49 categories)	Yes	Yes	Yes
N	123230	123230	123230
R^2	.399	.399	.399
F	1169	1106	1153

Source: See Table 29.

Notes: (1) Universe is all private sector prime age wage and salary workers between age 16 and 64 employed in the construction or construction-related professional services industries; observations with imputed earnings are excluded where identified; (2) Reported number is the percentage difference in annual wages between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 33. Annual Wage Earnings Regressions, Construction and Related Industries, 1992-2002

Independent Variables	Specification		
	(1)	**(2)**	**(3)**
Black	-0.196	-0.197	-0.197
	(25.63)	(25.69)	(25.69)
Hispanic	-0.175	-0.175	-0.175
	(29.57)	(29.56)	(29.56)
Asian	-0.116	-0.118	-0.118
	(9.05)	(9.21)	(9.21)
Native American	-0.103	-0.102	-0.103
	(7.2)	(7.12)	(7.2)
White Female	-0.245	-0.244	-0.244
	(48.99)	(48.36)	(48.36)
Age	0.062	0.062	0.062
	(61.08)	(61.09)	(61.09)
Age^2	-0.001	-0.001	-0.001
	(47.95)	(47.96)	(47.96)
Minnesota	0.009	0.014	0.015
	(0.35)	(0.51)	(0.54)
Minnesota*Black		0.517	0.516
		(2.25)	(2.25)
Minnesota*Hispanic		0.106	
		(0.68)	
Minnesota*Asian		0.489	0.488
		(2.35)	(2.34)
Minnesota*Native American		-0.030	
		(0.23)	
Minnesota*White Female		-0.099	-0.100
		(2.28)	(2.30)
Time (11 categories)	Yes	Yes	Yes
Education (continuous)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (49 categories)	Yes	Yes	Yes
N	60581	60581	60581
R^2	.373	.373	.373
F	439	414	423

Source: See Table 30.

Notes: (1) Universe is all private sector prime age wage and salary workers between age 16 and 64 employed in the construction or construction-related professional services industries; observations with imputed earnings are excluded where identified; (2) Reported number is the percentage difference in annual wages between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 34. Annual Business Owner Earnings Regressions, All Industries, 2000

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.280	-0.279	-0.280
	(22.27)	(22.13)	(22.27)
Hispanic	-0.187	-0.187	-0.187
	(17.05)	(17.07)	(17.05)
Asian/Pacific Islanders	-0.035	-0.036	-0.035
	(2.33)	(2.38)	(2.33)
Native American	-0.380	-0.378	-0.380
	(13.45)	(13.22)	(13.45)
Other Race	-0.261	-0.260	-0.261
	(13.44)	(13.3)	(13.44)
White Female	-0.437	-0.437	-0.437
	(83.89)	(83.05)	(83.89)
Age	0.165	0.165	0.165
	(91.66)	(91.66)	(91.66)
Age^2	-0.002	-0.002	-0.002
	(81.87)	(81.87)	(81.87)
Minnesota	-0.177	-0.176	-0.177
	(3.39)	(3.29)	(3.39)
Minnesota*Black		-0.276	
		(1.45)	
Minnesota*Hispanic		0.253	
		(1.08)	
Minnesota* Asian/Pacific Islanders		0.189	
		(0.86)	
Minnesota* Native American		-0.143	
		(0.62)	
Minnesota*Other Race		-0.153	
		(0.75)	
Minnesota*White Female		-0.001	
		(0.04)	
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	350756	350756	350756
R^2	.170	.170	.170
F	448	431	448

Source: NERA calculations from the 2000 Decennial Census Five Percent Public Use Microdata Samples.

Notes: (1) Universe is all persons in the private sector with positive business income between age 16 and 64; observations with imputed values to the dependent variable and all independent variables are excluded; (2) Reported number is the percentage difference in annual business earnings between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes persons identifying themselves as belonging in more than one racial category; (5) Geography is defined based on place of residence.

Table 35. Annual Business Owner Earnings Regressions, All Industries, 1979-1991

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.500	-0.499	-0.500
	(15.64)	(15.55)	(15.64)
Hispanic	-0.278	-0.278	-0.278
	(9.46)	(9.43)	(9.46)
Other Race	-0.328	-0.325	-0.328
	(8.29)	(8.16)	(8.29)
White Female	-0.729	-0.729	-0.729
	(68.07)	(67.56)	(68.07)
Age	0.205	0.205	0.205
	(41.42)	(41.42)	(41.42)
Age^2	-0.002	-0.002	-0.002
	(36.5)	(36.49)	(36.5)
Minnesota	-0.344	-0.334	-0.344
	(3.94)	(3.52)	(3.94)
Minnesota*Black		-0.278	
		(0.54)	
Minnesota*Hispanic		-0.284	
		(0.41)	
Minnesota*Other Race		-0.728	
		(1.71)	
Minnesota*White Female		-0.010	
		(0.08)	
Time (13 categories)	Yes	Yes	Yes
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	82094	82094	82094
R^2	.177	.177	.177
F	153.23	148.10	153.23

Source: NERA calculations from the Annual Demographic (March) File of the 1979-1991 Current Population Survey microdata samples.

Notes: (1) Universe is all persons in the private sector with positive business income between age 16 and 64; observations with imputed earnings are excluded where identified; (2) Reported number is the percentage difference in annual business earnings between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 36. Annual Business Owner Earnings Regressions, All Industries, 1992-2002

Independent Variables	Specification		
	(1)	**(2)**	**(3)**
Black	-0.591	-0.589	-0.591
	(14.85)	(14.74)	(14.85)
Hispanic	-0.390	-0.389	-0.390
	(9.80)	(9.76)	(9.80)
Asian	-0.221	-0.225	-0.221
	(3.41)	(3.47)	(3.41)
Native American	-0.511	-0.510	-0.511
	(5.47)	(5.44)	(5.47)
White Female	-0.617	-0.616	-0.617
	(31.34)	(31.02)	(31.34)
Age	0.230	0.230	0.230
	(27.27)	(27.27)	(27.27)
Age^2	-0.002	-0.002	-0.002
	(23.80)	(23.81)	(23.80)
Minnesota	0.056	0.129	0.056
	(0.33)	(0.64)	(0.33)
Minnesota*Black		-0.644	
		(1.14)	
Minnesota*Hispanic		0.009	
		(0.01)	
Minnesota*Asian		0.919	
		(0.84)	
Minnesota*Native American		-0.165	
		(0.09)	
Minnesota*White Female		-0.139	
		(0.76)	
Time (11 categories)	Yes	Yes	Yes
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	55639	55639	55639
R^2	.128	.129	.128
F	64.40	61.98	64.40

Source: NERA calculations from the Annual Demographic (March) File of the 1992-2002 Current Population Survey microdata samples.

Notes: (1) Universe is all persons in the private sector with positive business income between age 16 and 64; observations with imputed earnings are excluded where identified; (2) Reported number is the percentage difference in annual business earnings between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 37. Business Owner Earnings Regressions, Construction and Related Industries, 2000

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.290	-0.289	-0.290
	(9.02)	(9)	(9.02)
Hispanic	-0.145	-0.144	-0.145
	(6.24)	(6.18)	(6.24)
Asian/Pacific Islanders	-0.056	-0.057	-0.056
	(1.10)	(1.12)	(1.10)
Native American	-0.367	-0.365	-0.367
	(6.79)	(6.66)	(6.79)
Other Race	-0.139	-0.136	-0.139
	(2.97)	(2.87)	(2.97)
White Female	-0.513	-0.514	-0.513
	(29.41)	(29.13)	(29.41)
Age	0.140	0.140	0.140
	(34.49)	(34.49)	(34.49)
Age^2	-0.001	-0.001	-0.001
	(32.16)	(32.16)	(32.16)
Minnesota	0.066	0.068	0.066
	(0.52)	(0.53)	(0.52)
Minnesota*Black		-0.650	
		(0.77)	
Minnesota*Hispanic		-0.298	
		(0.86)	
Minnesota* Asian/Pacific Islanders		0.528	
		(0.44)	
Minnesota* Native American		-0.100	
		(0.25)	
Minnesota*Other Race		-0.269	
		(0.72)	
Minnesota*White Female		0.081	
		(0.49)	
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	56589	56589	56589
R^2	.056	. 056	.056
F	45.16	41.80	45.16

Source: See Table 34.

Notes: (1) Universe is all persons in the private sector with positive business income between age 16 and 64 in the construction or construction-related professional services industries; observations with imputed values to the dependent variable and all independent variables are excluded; (2) Reported number is the percentage difference in annual business earnings between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes persons identifying themselves as belonging in more than one racial category; (5) Geography is defined based on place of residence.

Table 38. Business Owner Earnings Regressions, Construction and Related Industries, 1979-1991

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.428	-0.415	-0.416
	(5.73)	(5.51)	(5.51)
Hispanic	-0.252	-0.247	-0.250
	(3.96)	(3.87)	(3.94)
Other Race	-0.208	-0.211	-0.207
	(1.79)	(1.81)	(1.78)
White Female	-0.835	-0.831	-0.831
	(21.63)	(21.21)	(21.22)
Age	0.179	0.179	0.179
	(16.58)	(16.59)	(16.59)
Age^2	-0.002	-0.002	-0.002
	(15.29)	(15.31)	(15.31)
Minnesota	-0.275	-0.181	-0.188
	(1.19)	(0.73)	(0.77)
Minnesota*Black		-0.999	-0.999
		(3.79)	(3.78)
Minnesota*Hispanic		-0.700	
		(0.95)	
Minnesota*Other Race		1.527	
		(0.52)	
Minnesota*White Female		-0.865	-0.864
		(2.69)	(2.68)
Time (13 categories)	Yes	Yes	Yes
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	12577	12577	12577
R^2	.077	.079	.079
F	14.99	14.51	14.80

Source: See Table 35.

Notes: (1) Universe is all persons in the private sector with positive business income between age 16 and 64 in the construction or construction-related professional services industries; observations with imputed earnings are excluded where identified; (2) Reported number is the percentage difference in annual business earnings between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 39. Business Owner Earnings Regressions, Construction and Related Industries, 1992-2002

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.323	-0.317	-0.323
	(2.4)	(2.34)	(2.4)
Hispanic	-0.145	-0.146	-0.145
	(1.38)	(1.39)	(1.38)
Asian	-0.180	-0.180	-0.180
	(0.84)	(0.84)	(0.84)
Native American	-0.208	-0.208	-0.208
	(0.76)	(0.76)	(0.76)
White Female	-0.839	-0.840	-0.839
	(15.73)	(15.62)	(15.73)
Age	0.190	0.190	0.190
	(8.71)	(8.71)	(8.71)
Age^2	-0.002	-0.002	-0.002
	(7.89)	(7.89)	(7.89)
Minnesota	0.044	0.048	0.044
	(0.11)	(0.12)	(0.11)
Minnesota*Black		-0.900	
		(0.90)	
Minnesota*Hispanic		1.329	
		(0.33)	
Minnesota*Asian			
Minnesota*Native American			
Minnesota*White Female		0.142	
		(0.14)	
Time (11 categories)	Yes	Yes	Yes
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (88 categories)	Yes	Yes	Yes
N	8446	8446	8446
R^2	.064	.064	.064
F	6.97	6.74	6.97

Source: See Table 36.

Notes: (1) Universe is all persons in the private sector with positive business income between age 16 and 64 in the construction or construction-related professional services industries; observations with imputed earnings are excluded where identified; (2) Reported number is the percentage difference in annual business earnings between a given group and white men; (3) Number in parentheses is the absolute value of the associated t-statistic. Using a two-tailed test, t-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 40. Self-Employment Rates in 2000 for Selected Race and Sex Groups: All Industries; United States and the State of Minnesota

Race/Sex	U.S.	State of Minnesota
Black	4.8	3.2
Hispanic	6.8	4.1
Asian	9.8	4.9
Native American	7.7	5.1
Multiple Races	8.9	5.3
White female	7.9	7.7
White male	13.1	12.9

Source: NERA calculations from the 2000 Decennial Census Five Percent Public Use Microdata Samples.

Table 41. Self-Employment Rates in 2000 for Selected Race and Sex Groups: Construction and Related Industries; United States and the State of Minnesota

Race/Sex	U.S. (%)	Minnesota
Black	14.0	4.6
Hispanic	12.2	11.5
Asian	16.0	16.1
Native American	15.3	6.5
Multiple Races	19.6	17.4
White female	14.2	16.8
White male	24.3	25.7

Source: NERA calculations from the 2000 Decennial Census Five Percent Public Use Microdata Samples.

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Table 42. Business Formation Regressions, All Industries, 2000

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.045	-0.045	-0.045
	(99.37)	(98.88)	(98.89)
Hispanic	-0.035	-0.035	-0.035
	(80.93)	(80.43)	(80.45)
Asian/Pacific Islanders	-0.015	-0.015	-0.015
	(24.36)	(23.85)	(23.86)
Native American	-0.034	-0.033	-0.033
	(26.46)	(25.66)	(25.67)
Other Race	-0.018	-0.018	-0.018
	(19.19)	(18.84)	(19.14)
White Female	-0.029	-0.029	-0.029
	(101.53)	(100.05)	(100.08)
Age	0.010	0.010	0.010
	(143.25)	(143.25)	(143.25)
Age^2	-0.000	-0.000	-0.000
	(101.43)	(101.43)	(101.43)
Minnesota	-0.008	-0.005	-0.005
	(3.03)	(1.89)	(1.97)
Minnesota*Black		-0.024	-0.024
		(2.77)	(2.75)
Minnesota*Hispanic		-0.025	-0.025
		(3.46)	(3.43)
Minnesota* Asian/Pacific Islanders		-0.028	-0.027
		(3.95)	(3.93)
Minnesota* Native American		-0.032	-0.032
		(3.41)	(3.39)
Minnesota*Other Race		-0.018	-0.004
		(1.95)	(2.50)
Minnesota*White Female		-0.004	
		(2.63)	
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	4032101	4032101	4032101
Pseudo R^2	0.158	0.158	0.158
Chi^2	420000	420000	420000
Log Likelihood	-1120490	-1120463	-1120465

Source: NERA calculations from the 2000 Decennial Census Five Percent Public Use Microdata Samples.

Notes: (1) Universe is all private sector prime age labor force participants between age 16 and 64; observations with imputed values to the dependent variable and all independent variables are excluded; (2) Reported number represents the percentage point probability difference in business ownership rates between a given group and white men, evaluated at the mean business ownership rate for the estimation sample; (3) Number in parentheses is the absolute value of the associated z-statistic. Using a two-tailed test, z-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes persons identifying themselves as belonging in more than one racial category; (5) Geography is defined based on place of residence.

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Table 43. Business Formation Regressions, All Industries, 1979-1991

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.037	-0.037	-0.037
	(93.66)	(93.45)	(93.64)
Hispanic	-0.028	-0.028	-0.028
	(58.68)	(58.47)	(58.5)
Other Race	-0.016	-0.016	-0.016
	(25.92)	(25.58)	(25.6)
White Female	-0.027	-0.027	-0.027
	(100.93)	(100.08)	(100.93)
Age	0.011	0.011	0.011
	(178.81)	(178.8)	(178.8)
Age^2	-0.000	-0.000	-0.000
	(139.92)	(139.91)	(139.91)
Minnesota	0.030	0.031	0.031
	(16.17)	(15.21)	(16.47)
Minnesota*Black		-0.006	-0.032
		(0.61)	(2.81)
Minnesota*Hispanic		-0.032	-0.023
		(2.84)	(3.04)
Minnesota*Other Race		-0.023	
		(3.08)	
Minnesota*White Female		-0.001	
		(0.63)	
Time (6 categories)	Yes	Yes	Yes
Education (continuous)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (49 categories)	Yes	Yes	Yes
N	2684590	2684590	2684590
Pseudo R^2	.245	.245	.245
Chi^2	4400000	4400000	4400000
Log Likelihood	-671453	-671443	-671443

Source: NERA calculations from the Merged Outgoing Rotation Groups of the 1979-1991 Current Population Survey microdata samples.

Notes: (1) Universe is all private sector prime age labor force participants between age 16 and 64; observations with imputed earnings are excluded where identified; (2) Reported number represents the percentage point probability difference in business ownership rates between a given group and white men, evaluated at the mean business ownership rate for the estimation sample; (3) Number in parentheses is the absolute value of the associated z-statistic. Using a two-tailed test, z-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 44. Business Formation Regressions, All Industries, 1992-2002

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.048	-0.048	-0.048
	(78.37)	(78.2)	(78.37)
Hispanic	-0.041	-0.041	-0.041
	(61.79)	(61.59)	(61.78)
Asian	-0.015	-0.015	-0.015
	(16.51)	(16.27)	(16.51)
Native American	-0.030	-0.030	-0.030
	(19.24)	(18.93)	(18.94)
White Female	-0.026	-0.026	-0.026
	(62.43)	(61.91)	(62.43)
Age	0.013	0.013	0.013
	(125.43)	(125.42)	(125.43)
Age^2	-0.000	-0.000	-0.000
	(89.59)	(89.59)	(89.59)
Minnesota	0.018	0.020	0.019
	(7.51)	(6.99)	(7.6)
Minnesota*Black		0.011	-0.033
		(0.92)	(2.02)
Minnesota*Hispanic		-0.020	
		(1.5)	
Minnesota*Asian		-0.020	
		(1.9)	
Minnesota*Native American		-0.033	
		(2.05)	
Minnesota*White Female		-0.001	
		(0.23)	
Time (11 categories)	Yes	Yes	Yes
Education (continuous)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (49 categories)	Yes	Yes	Yes
N	1924167	1924167	1924167
Pseudo R^2	.215	.215	.215
Chi^2	3100000	3100000	3100000
Log Likelihood	-568248	-568242	-568246

Source: NERA calculations from the Merged Outgoing Rotation Groups of the 1992-2002
Current Population.

Notes: (1) Universe is all private sector prime age labor force participants between age 16
and 64; observations with imputed earnings are excluded where identified; (2) Reported
number represents the percentage point probability difference in business ownership rates
between a given group and white men, evaluated at the mean business ownership rate for
the estimation sample; (3) Number in parentheses is the absolute value of the associated z-
statistic. Using a two-tailed test, z-statistics greater than 1.67 (1.99) (2.64) are statistically
significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics,
Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined
based on place of residence.

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Table 45. Business Formation Regressions, Construction and Related Industries, 2000

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.097	-0.097	-0.097
	(30.16)	(30.06)	(30.16)
Hispanic	-0.076	-0.076	-0.076
	(31.21)	(31.13)	(31.21)
Asian/Pacific Islanders	-0.057	-0.057	-0.057
	(10.55)	(10.54)	(10.55)
Native American	-0.080	-0.078	-0.080
	(12.1)	(11.69)	(12.1)
Other Race	-0.031	-0.031	-0.031
	(5.46)	(5.45)	(5.46)
White Female	-0.085	-0.085	-0.085
	(39.98)	(39.75)	(39.98)
Age	0.025	0.025	0.025
	(60.06)	(60.05)	(60.06)
Age^2	-0.000	-0.000	-0.000
	(44.02)	(44.02)	(44.02)
Minnesota	0.049	0.048	0.049
	(3.06)	(2.99)	(3.06)
Minnesota*Black		-0.144	
		(1.73)	
Minnesota*Hispanic		-0.023	
		(0.51)	
Minnesota* Asian/Pacific Islanders		0.017	
		(0.19)	
Minnesota* Native American		-0.091	
		(1.92)	
Minnesota*Other Race		0.007	
		(0.11)	
Minnesota*White Female		0.026	
		(1.54)	
Education (16 categories)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (25 categories)	Yes	Yes	Yes
N	343116	343116	343116
Pseudo R^2	.076	.076	.076
Chi^2	26943	26954	26943
Log Likelihood	-165115	-165109	-165115

Source: See Table 42.

Notes: (1) Universe is all private sector prime age labor force participants in the construction sector between age 16 and 64; observations with imputed values to the dependent variable and all independent variables are excluded; (2) Reported number represents the percentage point probability difference in business ownership rates between a given group and white men, evaluated at the mean business ownership rate for the estimation sample; (3) Number in parentheses is the absolute value of the associated z-statistic. Using a two-tailed test, z-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes persons identifying themselves as belonging in more than one racial category; (5) Geography is defined based on place of residence.

Table 46. Business Formation Regressions, Construction and Related Industries, 1979-1991

Independent Variables	Specification		
	(1)	(2)	(3)
Black	-0.085	-0.085	-0.085
	(25.12)	(25.07)	(25.12)
Hispanic	-0.065	-0.064	-0.065
	(16.79)	(16.76)	(16.79)
Other Race	-0.095	-0.095	-0.095
	(18.24)	(18.22)	(18.24)
White Female	-0.099	-0.098	-0.099
	(36.87)	(36.53)	(36.87)
Age	0.028	0.028	0.028
	(61.25)	(61.25)	(61.25)
Age^2	-0.000	-0.000	-0.000
	(49.49)	(49.49)	(49.49)
Minnesota	-0.005	0.020	-0.005
	(0.36)	(1.71)	(0.36)
Minnesota*Black		-0.015	
		(0.14)	
Minnesota*Hispanic		0.054	
		(0.64)	
Minnesota*Other Race		-0.026	
		(0.94)	
Minnesota*White Female			
Time (6 categories)	Yes	Yes	Yes
Education (continuous)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (49 categories)	Yes	Yes	Yes
N	209444	209432	209444
Pseudo R^2	.082	.082	.082
Chi^2	16816	16819	16816
Log Likelihood	-93584	-93582	-93584

Source: See Table 43.

Notes: (1) Universe is all private sector prime age labor force participants between age 16 and 64 in the construction or construction-related professional services industries; observations with imputed earnings are excluded where identified; (2) Reported number represents the percentage point probability difference in business ownership rates between a given group and white men, evaluated at the mean business ownership rate for the estimation sample; (3) Number in parentheses is the absolute value of the associated z-statistic. Using a two-tailed test, z-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 47. Business Formation Regressions, Construction and Related Industries, 1992-2002

Independent Variables	Specification		
	(1)	**(2)**	**(3)**
Black	-0.110	-0.110	-0.110
	(23.82)	(23.78)	(23.82)
Hispanic	-0.091	-0.091	-0.091
	(21.01)	(21.04)	(21.01)
Asian	-0.075	-0.075	-0.075
	(8.94)	(8.89)	(8.94)
Native American	-0.089	-0.089	-0.089
	(10.1)	(9.98)	(10.1)
White Female	-0.048	-0.049	-0.048
	(13.72)	(13.81)	(13.72)
Age	0.033	0.033	0.033
	(48.78)	(48.78)	(48.78)
Age^2	-0.000	-0.000	-0.000
	(36.89)	(36.89)	(36.89)
Minnesota	0.010	0.006	0.010
	(0.55)	(0.34)	(0.55)
Minnesota*Black		-0.078	
		(0.59)	
Minnesota*Hispanic		0.123	
		(1.13)	
Minnesota*Asian		-0.078	
		(0.78)	
Minnesota*Native American		0.053	
		(1.61)	
Minnesota*White Female			
Time (11 categories)	Yes	Yes	Yes
Education (continuous)	Yes	Yes	Yes
Geography (51 categories)	Yes	Yes	Yes
Industry (49 categories)	Yes	Yes	Yes
N	153805	153798	153805
Pseudo R^2	.090	.090	.090
Chi^2	15294	15297	15294
Log Likelihood	-77525	-77522	-77525

Source: See Table 44.

Notes: (1) Universe is all private sector prime age labor force participants between age 16 and 64 in the construction or construction-related professional services industries; observations with imputed earnings are excluded where identified; (2) Reported number represents the percentage point probability difference in business ownership rates between a given group and white men, evaluated at the mean business ownership rate for the estimation sample; (3) Number in parentheses is the absolute value of the associated z-statistic. Using a two-tailed test, z-statistics greater than 1.67 (1.99) (2.64) are statistically significant at a 90 (95) (99) percent confidence level; (4) "Other Race" includes Hispanics, Asian/Pacific Islanders, and American Indians/Alaska Natives; (5) Geography is defined based on place of residence.

Table 48. Actual and Potential Business Formation Rates—Minnesota Construction and Consulting Markets

Race/Sex	Actual Business Formation Rate (%)	Potential Business Formation Rate (%)	Disparity Ratio
	(1)	(2)	(3)
Black	4.6	14.3	32.2
Hispanic	11.5	19.1	60.2
Asian/Pacific Islander	16.1	21.8	73.9
American Indian/Alaska Native	6.5	14.5	44.8
Multiple races reported	17.4	20.5	84.9
White female	16.8	25.3	66.4
All minority and female	15.1	23.2	65.1

Notes: Figures in column (1) are average self-employment rates weighted using PUMS population-based person weights reported above in Table 41. Figures in column (2) are derived from combining the figure in column (1) with the corresponding result from Table 45. Column (3) is simply column (2) divided by column (1).

Source: 2000 Five Percent PUMS.

Table 49. Comparison of Baseline to Adjusted DBE Availability for Mn/DOT

Contracting Area	Baseline DBE Availability (%)	Adjusted DBE Availability (%)
Construction	15.18	23.56
Consulting	16.58	21.27
TOTAL – All FEDERAL-AID PROJECTS	15.30	23.40

Source: (1) Mn/DOT contract databases; (2) Dun & Bradstreet's *MarketPlace*; (3) business directory information compiled by NERA; (4) NERA misclassification surveys; and (5) the Five Percent 2000 PUMS.

VIII. CONCLUSION

In this study, NERA estimated the availability of minority-owned and woman-owned businesses in Mn/DOT's contracting markets. This involved identifying the relevant markets for federally-assisted Mn/DOT contracting—that is, the main industries and localities where Mn/DOT spends its dollars. In consultation with Mn/DOT, NERA identified 35 distinct four-digit SIC codes in construction and 9 in consulting that account for virtually all contract spending on Mn/DOT projects. We found that from FFY 2000 and FFY 2004, approximately 90 percent of Mn/DOT's construction and consulting contract spending was with businesses located in the State of Minnesota.

A further challenge was to count businesses in the relevant markets and determine the proportion that was owned by minorities and women. To count the number of businesses, we used Dun & Bradstreet's *MarketPlace* database to determine the total number operating in the relevant geographic and product markets. *MarketPlace* does not adequately identify all businesses owned by minorities and women however. NERA took a number of steps to overcome this limitation. First, we completed an intensive regional search for information on minority-owned and woman-owned businesses in and surrounding the Minnesota area. Second, we applied misclassification survey results to correct for the fact that some firms classified as minority or woman owned were in fact not minority owned or woman owned and vice versa. We demonstrate that of the firms that were listed as DBEs, more than one-in-four, on average, were wrongly classified and were actually owned by White males. Similarly, many businesses in the *MarketPlace* database did not have the race or gender of their owners identified. Most, but not all, of these firms are likely to be White male owned. To quantify this, we conducted misclassification survey results showing that on average 11.1 percent of these initially unclassified businesses were actually owned by women and/or minorities.

Once the relevant product markets were established and we had an accurate estimate of the ownership status of the businesses in the database, we estimated final baseline DBE availability. Our final baseline estimates are 15.18 percent in construction, 16.58 percent in consulting, and 15.30 percent overall. Finally, Step 2 adjustments were estimated using data from the 2000 Five Percent PUMS to take account of the fact that the baseline numbers are

lower than what would be expected in a race and sex neutral marketplace. Step 2 adjusted availability estimates are 23.51 percent for construction, 21.27 percent for consulting, and 23.40 percent overall.

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